China's Labour Market Transition: Labour Mobility and Wages

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Abstract

After the 1978 policy of reform and opening up, Chinese economy is transiting from a planned economy to a market one. Meanwhile, its labour force also became more mobile, leading to job turnover and internal migration. In addition, the wage setting became more market-oriented rather than centrally administered. Motivated by these changes in the post-reform Chinese labour market, this thesis empirically investigates job turnover, wage compensation and return migration in China, all of which consider the impact of the household registration system.

Chapter two empirically studies job turnover in China. The 1978 policy of reform and opening up brought changes to the Chinese labour market. For example, the number of life-long employment was reducing and meanwhile the scale of the non-public sector was expanding. Therefore, people have more employment choices than before. Using employment histories recorded in the 2008 China General Social Survey, discrete-time survival analysis is used to examine the motivations for job turnover. Respondents registered in urban and rural areas are considered separately in the analysis. However, the results show no significant difference in job turnover between urban and rural registered people.

As bonuses, housing subsidies and social insurances are currently common employment benefits in China, chapter three asks whether there is a wage reduction when higher benefits are provided to employees, which can be explained by the compensating wage differentials hypothesis. Using data from the 2009 Rural-Urban Migration in China, both urban employees and migrant workers are included in the sample. A wage equation and three benefit equations are estimated simultaneously. Instrumental variables are selected to correct for the endogeneity problem of benefit variables in the wage equation. The results show that there is no trade-off between wages and benefits, meaning that benefits do not have a compensating effect to wages.

The fourth chapter uses Cox survival analysis to study the return migration in China. Previous studies have found that return migration in China is due to the

household registration system and the macroeconomic environment both domestically and internationally. However, this chapter argues that return migration is more likely to be associated with employment and household factors. Employing data from the 2009 Rural-Urban Migration in China, chapter four considers the heterogeneity in return migration between the new and old generation migrants, where the former are taken to be born after 1980. The results show that the new generation migrants experience more return migration than their old counterparts. This implies that integrating to cities may be difficult even if the new generation migrants have a stronger desire to stay in cities permanently.

The thesis concludes that although the Chinese labour market is becoming more mobile and wage setting is more flexible, people with different registration status are experiencing different outcomes and respond differently to these changes. Therefore, the policy implication of this thesis is that the Chinese society as well as its labour market should transit from a dual track system to an integrated one.

Key words: job turnover; compensating wage differentials; return migration; China

Chapter One

Introduction to the Thesis

1.1 Research Background

The thesis investigates labour market changes in China after the 1978 policy of reform and opening up. In particular, this thesis considers the impact of the household registration system on the labour market changes.

The household registration system was established in the 1950s. The initial purpose of the household registration system was to collect and manage residential information (Cheng and Selden, 1994). Individuals who were born in urban areas were entitled to an urban registration (urban residents) while individuals who were born in rural areas were entitled to a rural registration (rural residents). Afterwards, newborns had to be registered the same as their parents regardless of their actual birth place (Meng et al., 2013).

Therefore, Chinese society as well as its labour market were segregated into an urban part and a rural part. Before the introduction of the household responsibility system in 1982, the incomes of rural residents depended on their collective agricultural production. By contrast, in urban areas, the jobs and food were allocated to urban residents by government in the planned economy (Zhao, 2005). Meanwhile, the household registration system acted as an economic resource allocation mechanism before a market economy was formally established in 1992 (Cai, 2011), which contributed to the rapid social and economic development in urban areas. Due to an imbalance in the development between urban and rural areas, rural people might consider migrating to urban areas. However, the household registration system acted as a barrier to rural-urban migration until the mid-1980s. There were controls on this internal migration not only because of competition for food in urban areas, but also to avoid competition for resources such as education and health services in urban areas, as well as controlling urban population size (Zhao, 1999; Zhao, 2005). Therefore, rural labour was immobile and had to be attached to farm land in pre-reform China.

However, since the 1978 policy of reform and opening up, economic reforms were associated with changes in the household registration system. Rural economic reforms started earlier than those in urban areas. The most remarkable change in rural areas was the introduction of the household responsibility system in 1982, which was used to replace collective agricultural production in rural China. The new system stimulated individual incentives in agricultural production and hence increased the output significantly (Cai, 2011). Meanwhile, due to the increase in productivity, less people were required to engage in agricultural activities, which generated surplus labour in rural areas. Township and village enterprises were established and expanded to create job opportunities for the surplus rural labour. In 1980, only 9.2% of rural labour was employed in township and village enterprises while the proportion increased to 22% in 1992[1]. Meanwhile, surplus labour began to migrate to urban areas for non-farming job opportunities when the restriction on labour mobility between rural and urban areas was abandoned in the mid-1980s.

In urban China, public ownership was the main feature of the planned economy. In particular, 75.1 million urban workers were employed in state-owned enterprises, which accounted for 78.3% of urban workforce in 1978. Even in 1992, there were 108.9 million employed in state-owned enterprises, which accounted for 61% of the urban workforce[2]. Managers in the state-owned enterprises could not make decisions on personnel issues such as recruitment or dismissal and production was based on a state planning (Cai et al., 2008). The same wage paid to urban workers of the same grade whose employment was life-long. Although wages were low for urban workers, food prices were also low and fringe benefits such as health care were provided to employees. Therefore, the key characteristics of the pre-reform urban labour market were low job turnover and administratively determined wages.

However, since the 1990s, reforms were undertaken to attempt to terminate the life-long employment or the "iron rice bowl" in state-owned enterprises in the market economy. For example, enterprises obtained more independence on personnel issues

[1] Source: 1981 and 1991 China Statistical Yearbook.

[2] Source: 2001 China Statistical Yearbook.

with the introduction of a labour contract system (Cai et al., 2008). Meanwhile, in order to improve the competitiveness and efficiency of the state-owned enterprises, 21.37 million state-owned enterprise workers were laid-off in total between 1998 and 2000[3], which was accompanied by the development of the social insurance system.

In addition, the expansion of the non-state or private enterprises and export-oriented economy during the 1990s in urban China required a higher demand for labour and this has been met by rural residents migrating to urban areas (Meng et al., 2013). Those who registered in rural areas but work in urban areas are called migrant workers. However, since the early 2000s, some coastal cities in China have experienced a migrant labour shortage. This migrant labour shortage is a result of return migration, which is from urban to rural areas. The return motivations are not only because of the institutional barriers such as the household registration system for migrant workers to stay in cities permanently (Meng, 2012), but also some of migrant workers are able to find employment opportunities in a small city or town that is near their hometown.

To summarise, the transition of the Chinese economy from a planned economy to a market oriented one had two significant characteristics. Firstly, the labour force changed from an immobile to a mobile one. This mobility refers to not only job turnover which brings a wider employment opportunity to employees, but also to geographical mobility which occurs between rural and urban areas of China. The second remarkable characteristic of the changes is the improvement of welfare of employees. The wage setting changed from a centrally administered system to a market oriented one. Meanwhile, the average annual real wages of those individuals employed in urban labour market increased from 615 yuan in 1978 to 9452.12 yuan in 2014[4], which reflects China's post-reform high productivity growth. Employment benefits are continuously provided to workers along with the increase in wage.

1.2 Contributions and Structure of the Thesis

[3] Source: Xinhua News. Retrieved on 28 Oct 2015, http://news.xinhuanet.com/employment/2003-01/24/content_702257.htm

[4] Source: the National Bureau of Statistics of China. 1978 is the base year.

Motivated by the changes introduced above, this thesis empirically examines labour mobility and wages in the Chinese labour market, considering the impact of the household registration system particularly. Due to the fact that life-long employment is declining in post-reform labour market and employees may have a perception of job insecurity, the first research topic aims to identify which factors may motivate job turnover in China (chapter two). Previous Chinese studies on job turnover focus on either urban people or migrant workers. However, this chapter differentiate to these studies by comparing job turnover behaviours between urban and rural residents in China. Using detailed employment histories recorded in the 2008 China General Social Survey, discrete-time survival analysis is applied in chapter two. In addition, chapter two uses Chinese data to examine whether job turnover rate is higher at the beginning of the job and whether the probability of job turnover declines with job tenure, both of which are found by Farber (1999) with the US data.

Moreover, motivated by the reforms in wage system and changes in benefits, the second research question asks whether the increase in wages is associated with a decline in benefits, which can be explained by the compensating wage differentials hypothesis (chapter three). Using data from the Chinese part of the 2009 Rural-Urban Migration in China, this chapter focuses on urban labour market which includes urban and migrant workers. The contributions of this chapter are, firstly, a range of employment benefits is identified from the dataset to examine whether they have a substitution effect to wages rather than a single benefit which has been examined in the previous Chinese literature. The second contribution is to treat benefit variables endogenously in the wage equation and select instrumental variables to correct for the endogeneity problems.

The last research question focuses on migrant workers and asks what factors motivate return migration in China (chapter four). Survival analysis is applied to the same dataset as in chapter three, using the censoring status of the migration durations to distinguish return migrants and migrant workers. Chapter four contributes to the literature by considering the heterogeneity in return decisions between the new and old generation migrants, where the former are taken to be those born after 1980. Secondly, different from previous Chinese studies which emphasise the influence of the household

registration system on return migration, chapter four argues that return migration is more likely to be influenced by labour supply side factors such as employment and household characteristics. Therefore, the control variables in the return decision model are selected based on migration theories which are inclined to relate return migration to wages, savings and social networks.

Finally, conclusions and limitations of this thesis are presented in chapter five. In addition, policy implications and potential future research are discussed in the final chapter as well.

Chapter Two

Job Turnover in the Chinese Labour Market: A Comparison between Urban and Rural Residents

2.1 Introduction

In 1956, socialism was established in China and a public ownership economy was founded at the same time. Since then, China has followed the Soviet Union's pattern to develop a planned economy. However, after experiencing chaos from the Cultural Revolution (1966-1976), China began a gradual process of abandoning its planned economy and opened up to the world. Subsequently, the policy of reform and opening up was introduced in 1978. Meanwhile, a market-oriented economy was gradually established in China after Deng Xiaoping's southern tour in 1992.

China introduced a household registration system (known as *hukou*) in the 1950s (Cheng and Selden, 1994). The initial purpose of the household registration system was to collect and manage residential information. People were required to register as either urban or rural residents. Since then, Chinese society was divided into urban and rural areas. However, this system was also used to strictly control mobility from rural to urban areas, with a greater proportion of limited resources were prioritised for urban development. Although the role of controlling rural-urban mobility gradually was abandoned since the 1980s, the household registration system began to act as an institutional barrier. For instance, rurally registered people in urban areas may not benefit from the same health services and children's education as urban residents.

In addition, labour market changes were different in urban and rural areas. In the pre-reform urban China, life-long jobs were allocated to the urban residents either from local community offices (known as *jiedao banshi chu*) or educational institutions. Employers were mainly in the public sector, which included state-owned and collective-owned enterprises, as well as government departments. These employers were not allowed to recruit and dismiss staff freely. They were required to follow an

employment plan made by the central government (Li, 2013). Similarly, from the employees' side, individuals could not make decisions on job turnover. Therefore, the urban labour market was extremely immobile. The most obvious disadvantage of this system was that employers and employees might be mismatched and the absence of mobility prevented any corrections for this mismatch. Therefore, once mismatch occurred, employees might be less motivated in terms of the job itself and human capital investment.

However, reforms after 1978 gradually broke this life-long employment system and brought uncertainties to the urban labour market. For example, urban economy reforms in the early 1980s aimed to improve production efficiency and reduce surplus labour in the public sector (Meng, 2000). The 1990s' reforms aimed to improve the incentives of both managers and workers and to encourage the non-public sector to absorb surplus labour from the public sector (Dong and Xu, 2009). In addition, a more radical urban economy reform was launched in 1997. Downsizing and reorganisation among state-owned enterprises led to huge labour lay-offs (known as *xiagang*). Although policies and assistance were provided to help laid-off workers get reemployed, the number of workers in this situation increased from approximately 8.8 million in 1998 to 9.1 million in 2000[5]. Chinese conventionally regarded employment in the state-owned enterprises as the "iron rice bowl" or life-long employment, but reforms in the 1990s and after changed this perception.

In addition, China abolished the policy which used to guarantee university graduates a life-long job in the late 1990s. Meanwhile, China expanded undergraduate recruitment. Before the undergraduate recruitment expansion, 46.1% of high school graduates entered universities in 1998. This number increased significantly to 63.8% in 1999, when the expansion policy was implemented[6]. The expansion policy not only offered more higher education opportunities, but also alleviated labour market pressures by delaying the age for young people to get their first jobs (Liu, 2012). A similar expansion policy was applied to research degrees several years later. However, the

[5] Source: 1999 and 2001 China Labour Statistical Yearbook.

[6] Source: National Bureau of Statistics of China.

adverse consequence of this policy was that people may become overeducated, which creates job market problems.

Therefore, changes in the post-reform Chinese urban labour market, on the one hand, brought more choices for job seekers to decide whether to be employed in the public or non-public sector, which made voluntary job turnover possible. On the other hand, these changes accelerated the development of the social insurance system. In the pre-reform urban labour market, work units (known as *danwei*) in the public sector had their own welfare systems, such as health services and schools for children. Unemployment insurance seemed to be unnecessary as employment was life-long and pensions were set based on seniority and wage (Giles et al., 2013). However, in the post-reform urban labour market, welfare is provided by the social insurance system rather than the work units themselves. Employees also have a greater awareness of participating in insurance schemes than before.

The current social insurance system in China includes five different types of insurance. These are pension, health, unemployment, work injury and maternity (females only) insurances. In addition, there is a housing fund for employees to purchase commercial real estate products. However, only pension, health and unemployment insurances are in the dataset used in this chapter.

Pension insurance was the privilege of state-owned enterprises' employees until 1991. Since 2003, firms in either the state or non-state sector have been mandated to purchase pension insurance for employees. Besides employers and employees financially contributing to such insurance, both local and central government contributes to the insurance as well. However, a drawback of the current pension insurance system is that employers' contributions are not completely transferable when employees change jobs (Li and Wu, 2013).

Health insurance was not formally introduced until the late 1990s. There are three types of health insurance currently. The first is the Basic Health Insurance Scheme, which was introduced in 1998. Employers, employees and the government all contribute to the insurance payment. The drawback of this scheme is low coverage. Only urban employees and retirees in the public sector can benefit from this insurance. Therefore,

two more insurance schemes were introduced. One is the 2003 New Cooperate Medical Scheme, covering rural residents; another is the 2007 Basic Medical Insurance, targeting urban residents without formal employment such as students and unemployed urban residents.

Unemployment insurance is also paid by employers, employees and government. It works as protection when employees experience involuntary unemployment. Unemployment insurance not only provides living expenses during unemployed periods, but also provides some employment assistance.

Meanwhile, changes in the rural areas have also had an impact on the labour market. Before 1978, agricultural production in the rural areas was organised by production teams collectively following a work points system. In 1982, this old performance measurement system was replaced by a new household responsibility system. The new system enabled the allocation of products, income and labour to be determined by households themselves. Accordingly, there was an increasing awareness of the importance of individual efforts and production efficiency in agricultural activities. A surplus of rural labour was created as a result of the increase in productivity (Meng, 2000).

Therefore, many township and privately-owned enterprises were established which absorbed the surplus labour (Cai et al., 2008). Meanwhile, surplus labour from rural areas began to migrate into urban areas to seek job opportunities, forming a population of migrant workers. These rurally registered migrant workers often undertake dirty, dangerous and demanding jobs as cheap labour in urban areas (Meng, 2012). Although employed in urban areas, migrant workers cannot benefit from the same welfare support, such as social insurance, as their urban counterparts. It is difficult for migrant workers to stay in cities permanently and hence urban areas are only regarded as a place of work by them (Ye and Pan, 2011). For rural residents who do not migrate into urban areas, they may be employed in township and privately-owned enterprises. These enterprises are small in scale and may lack regulation from the local government. Therefore, instability and insecurity are often associated with employment in these enterprises.

Overall, the main feature of the pre-reform Chinese labour market in both urban

and rural areas was immobility (Meng, 2000). However, reforms after 1978 changed this situation. Either geographical mobility or job turnover is now common in the Chinese labour market. In addition, although household registration no longer restricts mobility, it acts as an internal passport system which prevents people from receiving equal benefits and welfare from work. For individuals with different types of the household registration, their concerns may be different when making the decision to change jobs.

In addition, job turnover is about both labour demand and supply. The demand side of labour is about decisions on hiring conditional on capital, labour and product markets (Ehrenberg and Smith, 2009). Job turnover from the demand side tends to be determined by factors such as employment scale and wages set by employers. Therefore, job turnover from the demand side is more likely to lead to an involuntary job loss. By contrast, the supply side of labour assumes that workers have already decided to work, so now it is a question of which employer to choose. If jobs offered are similar, then the choices are made based on the compensations and benefits of the jobs (Ehrenberg and Smith, 2009). Therefore, job turnover from the supply side is more likely to be voluntary job loss. Employees' decisions on quitting or staying may be based on whether employment benefits can be provided and whether jobs are secure. In fact, among those who reported whether they chose voluntary job loss, aproximately 88.24% of job turnover records in the sample of this chapter are in this category[7].

According to the background introduced above, this chapter aims to identify and examine which factors motivated job turnover between urban and rural residents after the 1978 policy of reform and opening up. This chapter contributes to the literature on job turnover in three ways. Firstly, unlike previous studies on this topic which only focuses on gender differences, this chapter introduces differences in the type of the household registration into the analysis. The household registration system is a unique characteristic of China. Therefore, when examining job turnover in the Chinese labour market, it is necessary to control for both the registration type and gender. The second

[7] Voluntary job loss includes voluntary quit and retirement while other situations are treated as involuntary job loss.

contribution of this chapter is that a discrete-time survival analysis on job turnover is added to the Chinese literature by using employment histories recorded in the 2008 China General Social Survey (CGSS). In this dataset, a respondent may have experienced job turnover more than once and therefore multiple employment records are possible, which is different from most of the single spell duration data in the literature. Unobserved heterogeneity should be controlled for in the multiple spells discrete-time survival analysis. Finally, this chapter is able to use Chinese data to examine whether the job turnover rate is high at the beginning of the job and whether the probability of job turnover declines with job tenure, both of which are stated and examined by Farber (1999) with U.S. data.

This chapter is organised as follows. Section 2.2 reviews relevant literature and Section 2.3 describes the data and methodology. Results from the discrete-time survival analysis are presented in Section 2.4 and conclusions are given in Section 2.5.

2.2 Literature Review

In this section, studies on job turnover in western countries and China are reviewed.

2.2.1 Job turnover studies in western countries

Sims (1994) argues that job turnover is due to the break of psychological contracts, which are unwritten contracts between employees and employers specifying the beliefs and perceptions in terms of the employment relationship. He finds that economic shocks such as downsizing and reorganisation lead to short-term employment common in the labour market and rare promotion opportunities. Therefore, short-term employment may decrease the employees' commitment to the organisation and increase the frequency of job turnover.

By contrast, Farber (1999) finds that long-term employment is common in the labour market. He uncovers three facts regarding job turnover and examines them by using the U.S. datasets[8]. The three facts are as follows: long-term employment

[8] These datasets are 1979-1991 Current Population Survey, 1984-1996 Displaced Workers Surveys and 1979-1991

relationships are common, most new jobs end early and the probability of a job ending declines with tenure. As firms may expect long-term employment relationships, higher wages are paid to those who have longer employment duration, which implies that the long-term employment relationship encourages firms to invest in firm-specific capital for employees. Therefore, Farber (1999) argues, employment duration can act as a proxy measurement for firm-specific capital investment. The implication of this study is that using employment duration is a sensible measurement for job turnover. However, as information on wages of each specific job is unavailable in the dataset used in this chapter, it is not possible to examine the relationship between wages and job turnover.

Burgess and Rees (1998) use pooled sample from the 1975-1993 General Household Survey to study job tenure with the same employer of British employees. They notice that all employment durations in the dataset are right-censored at the time of the survey and hence unable to get complete durations. In addition, the distribution of durations ranged from 4 weeks to 40 years. Both weaknesses of the data add complexity to using survival analysis to estimate the hazard of job turnover. Therefore, they use the logit model to estimate the probabilities of being with the current employer for less than one year and more than five years respectively. Gender is controlled for in the analysis. For example, they find that women with children are more likely to have a short employment duration compared to men, which suggests a gender difference in job tenure.

Some studies on job turnover build empirical models from the human capital perspective. They examine the causality between job turnover and human capital investment such as education and training. Royalty (1998) studies the relationship between education and job turnover. Using data from the 1979-1994 National Longitudinal Survey of Youth (NLSY), she applies a multinominal probit model to compare the probabilities of job-to-job and job-to-unemployment turnovers (each turnover acts as the base category in turn). She finds that better educated women have similar job turnover behaviour to that for men. In particular, when education attainment

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National Longitudinal Survey of Youth.

levels are beyond high school, women experience no difference in job turnover from both well and less educated men.

In addition, according to the psychological contract theory, although employees should be responsible for their own career development, employers need to provide training opportunities to assess employees' performances and update their employability for the changing labour market (Cavanaugh and Noe, 1999). Some studies examine the causality between job turnover and training as an evaluation of the training programme. For example, Gritz (1993) applies the continuous-time survival analysis to estimate the influence of training on employment duration with data from the 1979-1991 NLSY. He finds that private training received by American women can help to extend employment duration and reduce job change frequency. However, this effect is less significant for men because the effect of training may diminish rapidly with time. By contrast, receiving government training may decrease employment spells for both men and women. He attributes this outcome to the small proportion of respondents receiving government training.

Meanwhile, Sieben (2007) uses the data from a seven year consecutive interview for Dutch graduates from the academic year of 1990-1991 to examine the intention to search for another job after training, which can be regarded as the propensity of job turnover. In his logit model, the propensity of job turnover is not only controlled by type of training, but also considers the impact of factors such as funding and intensity of training (hours of training) on job turnover. Sieben (2007) finds that specific training in their own field decreases the probability that females search for another paid job, which suggests that training contributes to their human capital accumulation. By contrast, training in another field increases males' job turnover propensity. Meanwhile, self-funded training can increase the probability of males undertaking a job search, which reduces their commitment to organisations. Finally, longer hours of training are associated with a higher job turnover propensity among male employees.

However, Royalty (1996) believes that an individual's human capital investment will increase if the expected employment duration is also rising. Therefore, the predicted probability of staying in a current job and the predicted probability of leaving

for a new job (with no job turnover as the base category) are control variables in the multinominal probit model which compares the probability of receiving company training, off-job training and no training (base category). Using data from the 1979-1994 NLSY, she finds that training is significantly related to job turnover. In particular, males receive 25% more training when job turnover is controlled for in the analysis.

Moreover, some studies argue that job turnover can be reduced if insurance is provided. In this case, job turnover reduction seems to be from the labour demand side. For example, Mealli and Pudney (1996) argue that pensioned jobs can be attractive for employees who prefer stable and secure jobs. On the other hand, pensions may punish frequently mobile employees because they may suffer from pension loss if they leave jobs. Therefore, they estimate the hazards of transition among pensioned, non-pensioned, other employment (part-time or self-employment), unemployment and out of labour force. Using the competing risks model and data from the 1988/1989 British Retirement Survey, Mealli and Pudney (1996) find that a pensioned job is associated with longer employment duration.

Health insurance also has the effect of reducing job turnover. Kim and Philips (2010) apply the Weibull survival analysis to examine whether insured construction workers in the US have lower probability of job turnover. Using data from the 1996 and 2001 Survey of Income and Program Participation, shared frailty of multiple spells is controlled for with a gamma distribution. They find that both workers with union and nonunion employer provided health insurance experience less job turnover than those who do not have health insurance.

By contrast, job turnover can also be reduced from the labour supply side. Employees may voluntarily reduce job turnover as a result of insurance provided to them. Ellis and Ma (2011) call this adverse job turnover and argue that less healthy employees in American firms place more value on health insurance than healthy employees and hence they reduce job turnover if health insurance is offered to them.

2.2.2 Job turnover studies in China

Labour market reforms since the 1990s facilitate job turnover in China. Appleton et

al. (2002) investigate the determinants of being laid-off in the Chinese urban labour market since 1992, which is an involuntary job turnover as a result of resolving low efficiency among the state-owned enterprises. Using data from the 1999 Chinese Academy of Social Science Household Survey, their probit model on whether an individual has ever been laid-off reveals that women, middle-aged and unskilled workers are more likely to be laid-off, which implies the discriminatory side of lay-off policy.

Using the same dataset, Knight and Yueh (2006) extend their study sample to both urban residents and migrant workers in the urban labour market. Empirical evidence suggests that even after urban labour market reforms, the fact that urban residents prefer to avoid job turnover while migrant workers have a higher job turnover rate does not change greatly. Urban residents would consider changing job if they found better employment opportunity. By contrast, the frequent job turnover experienced by migrant workers may be associated with their rural registration status. Therefore, people with different registration status in the same labour market have different concerns regarding job turnover.

Given the impact of the household registration status on job turnover, Zhang (2010) compares job turnover among temporary migrant workers, permanent migrant workers and local urban residents by using the Cox survival analysis to examine the employment and unemployment durations experienced by them. The term "temporary migrant worker" refers to those who have not obtained the local registration status in their working city, while permanent migrants have. The results reveal that temporary migrant workers have longer employment duration and shorter unemployment duration than permanent migrant workers and urban residents, which suggests that temporary migrant workers experience less job turnover. Institutional barriers associated with registration status have led to costly job turnover for temporary migrant workers, which also make them less competitive in the urban labour market.

Overall, the above studies imply that the household registration system creates institutional discrimination in the Chinese labour market. People with different types of registration may have different job turnover rates and also different concerns about job

turnover. Therefore, the type of registration should be an important factor to be considered when studying job turnover in China.

In addition, gender differences in job turnover have also been found in the Chinese literature. Cao and Hu (2007) argue that gender differences in job turnover are not only as a result of Chinese labour market transition, but also due to family reasons. Data from the 1997 Chinese Coastal Survey classifies the reasons for job turnover as career-oriented job change, family-oriented job change, reassignment and involuntary job termination. The competing risks model results reveal that married women are less likely to experience career-oriented job turnover but have a higher propensity to experience family-oriented job change and involuntary job termination, which suggests that they do not sufficiently take advantage of opportunities in the labour market but pay more attention to their family role. However, a limitation of Cao and Hu's (2007) study is that they exclude rural residents from the sample. It might be interesting to compare job turnover motivations of rural and urban residents.

Using data from the 2008 China General Social Survey, Li (2013) examines the relationship between the ownership of a company and job turnover in China. To be specific, his discrete-time survival analysis results reveal that the non-state sector and informally employed employees have a higher hazard of job turnover than state sector and formally employed employees, suggesting that the development of the non-state sector in China is associated with the creation of informal employment opportunities. In terms of the pattern of job turnover, Li (2013) finds that job turnover is most likely to occur from non-state to non-state sector or from state to non-state sector, which implies that there are barriers for the non-state to state job turnover. However, this study does not consider the impact of the registration status on job turnover within or between sectors. In addition, the unobserved heterogeneity in the multiple spells duration data is only corrected for by reporting robust standard error in the analysis, which is a weakness of Li's (2013) methodology.

2.2.3 Summary

Job turnover studies between western countries and China show differences as well as similarities. In terms of differences, western countries tend to study job turnover from

the human capital perspective and to examine the impact of insurance on job turnover. By contrast, job turnover in China is associated with reforms in the state-owned enterprises since the 1990s. Meanwhile, urban and rural residents may have different concerns about job turnover. However, both studies in western countries and China have found gender differences in job turnover. Generally, females experience more job turnover than males. In terms of methodology, survival analysis is applied to examining job turnover in some of the studies. To be specific, the competing risks model is applied to compare different job turnover outcomes while continuous-time survival analysis is used to estimate employment duration. Discrete-time survival analysis is also used when detailed employment records are available. Therefore, the literature review justifies the point that, when studying job turnover in China, it is necessary to control for gender and type of household registration in the analysis.

2.3 Data and Methodology

In this section, data employed in this chapter, and the discrete-time survival analysis methodology, are introduced. Firstly, the reason for employing discrete-time survival analysis will be explained followed by a formal presentation of the model. Covariates used in the model are defined in the latter part of this section.

Data employed in this chapter are from the 2008 China General Social Survey (CGSS), which is a cross-sectional survey conducted by the National Survey Research Center of the Renmin University of China. The aim of the CGSS is to investigate the situation of employment and living condition of people from 28 provinces in China since the 1978 policy of reform and opening up. The 2008 CGSS randomly sampled individuals from 100 cities and counties in China. Then it further selected 600 urban communities and rural villages among these cities and counties. Finally, 6,000 individuals were interviewed in the original sample.

The questionnaire of the 2008 CGSS has a section asking for details related to the employment histories of respondents. To be specific, the questionnaire asks each respondent to provide detailed information on a work unit in which the respondent has

ever or currently been employed, including the start and end year of each job and some other information, such as ownership, type of contract and training record when employed in this work unit. The maximum number of employment records a respondent could provide is 10. However, the actual highest number of records is 8 in the dataset. As the objective of this chapter is to investigate the employment situation after the 1978 policy of reform and opening up in China, the study time is set between 1978 and 2008.

Discrete-time survival analysis will be used to analyse the data in this chapter. There are two reasons to explain why it is the discrete-time rather than continuous-time in survival analysis. Firstly, discrete-time data are common in social science. For the case of the 2008 CGSS, the start and end times of each job are only recorded in year while specific month or date are unknown. Therefore, job completion is recorded as a discrete process. However, Allison (1982) suggests that if the time interval is approximately the same as the average spell or sufficiently small, even data which are in discrete format, continuous-time survival analysis may still be applicable. In terms of the 2008 CGSS, the time interval is one year and the average completed employment spell is 6.18 years. Therefore, the treatment suggested by Allison (1982) does not make sense for this dataset. This gives another reason to use discrete-time survival analysis. The term, analysis time, is used to represent the time scale which starts from 1 at a one year time interval.

Most of the techniques for survival analysis are based on single spell survival data. However, as some respondents may have multiple employment records, the data in this chapter are multiple spells survival data. Therefore, some transformations should be undertaken before introducing the discrete-time survival analysis. The original data are recorded as one row per respondent, so it must be firstly reshaped into one row per employment record. After reshaping the data, either single or multiple employment records are created for each respondent.

Nonparametric analysis is introduced before presenting the discrete-time survival analysis methodology. In it, dependence among different records under the same respondent is not considered (Allison, 1982). Nonparametric analysis does not make any assumption about the functional form of the hazard function, it is a descriptive

analysis. One widely used nonparametric analysis is the Kaplan-Meier survival estimation (Kaplan and Meier, 1958). Kaplan-Meier is used to estimate the survival function, *S(t)*, which is the product probability of survival at the end of the *j*th time interval. Equation 2-1 gives the Kaplan-Meier survival estimate function, where n_j is the number of observations at the beginning of the time interval *j* and d_j is the number of observations completed at the end of time interval *j*. The estimated Kaplan-Meier survival function is reported graphically to show the product of the survival probability at each time interval.

$$\hat{S}(t) = \prod_{j|t_j \le t} \left(\frac{n_j - d_j}{n_j}\right) \tag{2-1}$$

For the discrete-time survival analysis, the dependent variable should be a binary variable. To estimate a binary dependent variable duration model, a complementary log-log model is chosen for two reasons. On the one hand, a complementary log-log model is suitable for estimating a model when a dependent variable has a significant proportion of either 0 or 1 (Cameron and Trivedi, 2005). In the dataset of this chapter, 0 accounts for a significant proportion of the dependent variable because job turnover may only occur at time *j*. Therefore, 0 is given to represent the continuous status of that job for other *j-1* time intervals. On the other hand, the proportional hazard assumption is widely applied in the continuous-time survival analysis, which means that the hazard given covariates is proportionate in the baseline hazard. In the discrete-time framework, only the complementary log-log model can satisfy this assumption, so it is a discrete-time proportional hazard model (Jenkins, 1995). Therefore, for grouped data, the complementary log-log model gives consistent estimation results as in the continuous-time survival model (Prentice and Gloeckler, 1978).

The derivation of the complementary log-log model starts from the definition of the continuous-time hazard function. In continuous-time survival analysis, the hazard is assumed to be proportional (equation 2-2),

$$h(z \mid x_{ij}) = h_0(z)\exp(\beta' x_{ij}) \tag{2-2}$$

where $h(z|x_{ij})$ is the continuous-time hazard function for subject *i* in cluster *j* at time *z*

and $h_0(z)$ is the baseline hazard function when all covariates x_{ij} are equal to zero.

When applying the proportional hazard assumption to survival function, it gives equation 2-3

$$S(z \mid x_{ij}) \equiv \Pr(Z_{ij} > z \mid x_{ij}) = S_0(z)^{\exp(\beta' x_{ij})} \tag{2-3}$$

where Z_{ij} is the continuous survival time for subject i in cluster j and $S_0(z)$ is the baseline survival function.

As it is grouped data, only integer values $T_{ij}=t$ are observed for the time interval (z_{t-1}, z_t), so the discrete-time hazard is the probability that an event occurs at time z_t conditional on not having occurred before time z_{t-1} (equation 2-4)

$$h_{tij} \equiv \Pr(T_{ij} = t \mid x_{ij}, T_{ij} > t-1) = \frac{\Pr(Z_{ij} > z_{t-1} \mid x_{ij}) - \Pr(Z_{ij} > z_t \mid x_{ij})}{\Pr(Z_{ij} > z_{t-1} \mid x_{ij})} = 1 - \frac{S(z_t \mid x_{ij})}{S(z_{t-1} \mid x_{ij})} \tag{2-4}$$

Substituting equation 2-3 to equation 2-4, it gives equation 2-5

$$1 - h_{tij} = \frac{S(z_t \mid x_{ij})}{S(z_{t-1} \mid x_{ij})} = \{\frac{S_0(z_t)}{S_0(z_{t-1})}\}^{\exp(\beta' x_{ij})} \tag{2-5}$$

Taking the natural logarithm to both sides, equation 2-5 becomes equation 2-6

$$\ln\{-\ln(1-h_{tij})\} = \beta' x_{ij} + \ln\{\ln S_0(z_{t-1}) - \ln S_0(z_t)\} \tag{2-6}$$

A similar process can be undertaken for the duration interval specific parameter, $\ln\{\ln S_0(z_{t-1}) - \ln S_0(z_t)\}$. Equation 2-6 is a linear function. This duration interval specific parameter is assumed to be a cubic polynomial. This assumption is made based on the facts that most of new jobs end early and the probability of a job ending declines with tenure (Farber, 1999). Therefore, it is sensible to assume that when other covariates are not controlled for in the analysis, the probability of job turnover should decline first and then increase with duration. Equation 2-6 transforms into equation 2-7,

$$\ln\{-\ln(1-h_{tij})\} = \alpha_1 seq_{1ij} + \alpha_2 seq_{2ij}^2 + \alpha_3 seq_{3ij}^3 + \beta' x_{ij} \tag{2-7}$$

and seq_{pij} represents the time sequence of each employment spell.

Equation 2-7 is suitable to estimate a single spell duration model. However, the survival data in this chapter are multiple spells data. To accommodate dependence among different employment records of the same respondent, it is necessary to control

for unobserved heterogeneity after adding covariates to the baseline hazard function. One simple method to erase the correlated errors and unobserved factors is to cluster respondents and then to report robust standard errors (Rabe-Hesketh and Skrondal, 2012; Kovacevic and Roberts, 2007).

Another method to control for unobserved heterogeneity is to include a random intercept ζ_j in equation 2-7 for respondent j (equation 2-8).

$$\ln\{-\ln(1-h_{tij})\} = \alpha_1 seq_{1ij} + \alpha_2 seq_{2ij}^2 + \alpha_3 seq_{3ij}^3 + \beta' x_{ij} + \varsigma_j \qquad (2\text{-}8)$$

where $\zeta_j \sim N(0, \psi)$ is normally distributed with zero mean and finite variance[9]. This method for controlling for unobserved heterogeneity is employed in this chapter. If the null hypothesis of the estimated residual correlation among the latent responses for employment records of the same respondent is equal to zero, it cannot be rejected (*rho* in the output), then unobserved heterogeneity becomes insignificant. The standard deviation of heterogeneity variance is also reported in the output (*sigma_u*).

Employment durations are defined as the difference between the end year of a job and the start year. For those who started and ended a job in the same year, the employment duration is set to one year. After expanding the data by employment duration, a person-period dataset is created. A binary job turnover indicator is generated to show whether job turnover occurs in a particular year. It takes the value 1 if the job is completed at a given year, and takes the value of 0 if the job is continuous or censored at the end of the study time. This job turnover indicator acts as the dependent variable in the discrete-time survival model. The advantages of using person-period data to undertake discrete-time survival analysis are that, firstly, it can show whether the potential event happens in a particular year. Secondly, both censored and uncensored information can be appropriately recorded. Finally, the discrete-time survival analysis is able to incorporate time-varying covariates in the analysis (Singer and Willett, 1993).

The explanatory variables can be divided into two groups. One group is the demographic variables. Current type of household registration is used to distinguish

[9] The Gamma distribution is widely applied to error terms in the discrete-time proportional hazard model, but Ondrich and Rhody (1999) suggest that it is complicated to calculate a Gamma distribution model with multiple spells. Therefore, the error term here is specified as the normal distribution.

whether the respondents are registered in urban or rural areas. In this chapter, people registered in urban areas are defined as urban residents while those registered in rural areas are rural residents[10]. The working age is set between 16 and 60 for both males and females[11]. Cohabiting, divorced and widowed are regarded as single while other situations are married[12]. Party membership represents those who joined the Communist Party of China, which is the leading party in China. Educational level represents the highest educational level obtained whilst in that job. The first education category is compulsory education, which includes primary school and junior high school and acts as the reference category. The second education category includes senior high school and relevant vocational technical education. The third education category is higher education, covering undergraduate to postgraduate levels. The final education category includes non-degree qualifications, such as MBA, advanced training and Communist Party school training. All these demographic variables except gender are time-varying.

The other group of explanatory variables is job-related. Whether the work unit is the public economy is used to represent the ownership of the work unit. To be specific, the public economy comprises state-owned enterprises and collective-owned enterprises while non-public economy includes private enterprises, foreign invested enterprises and jointly invested enterprises. Additionally, a dummy variable is created to represent whether a respondent signed a labour contract with the employer when employed in that work unit. Employees may receive training during their employment. The conventional human capital perspective classifies training as general training and specific training. However, as data in this chapter does not provide such detailed classification, only training from either external or internal sources can be defined. Internal training refers to training from the work unit itself, while external training may be received from either

[10] The definition does not concern the actual place of living.

[11] Retirement age in China differs between males and females, set at 60 for males, 55 for females with leadership and 50 for ordinary female employees. However, in this chapter, the working age is set at the same interval for both males and females.

[12] In most of the studies, cohabiting is regarded as married. However, marital status is a time-varying variable in the analysis and the 2008 CGSS does not provide information on the start year of cohabiting, which means it cannot show the change of cohabiting status in the dataset. Therefore, cohabiting is treated as unmarried in this chapter.

government or a third-party organisation. No training is set as the reference category. The social insurance dummy equals 1 if a respondent has any pension insurance, health insurance or unemployment insurance. All job-related variables are time-constant, which means the situation is constant within an employment record but it may vary among different records under the same respondent.

In the parametric analysis part, a model without controlling for unobserved heterogeneity is estimated in comparison to a model with such a control first. Then gender sub-samples and type of registration sub-samples are estimated before they are further decomposed to sub-samples of urban males, urban females, rural males and rural females. Two points should be clarified before presenting results. Firstly, although migrant workers can be identified from the sample based on their registration status and living place, this chapter does not study job turnover of migrant workers independently. Secondly, the registration status is a time-varying variable, which means the registration status may change either at the time when changing the job or during an employment period. The problem in the latter case is that an employment record would be categorised into different sub-samples. To avoid this, this chapter uses the registration status at the beginning of each job to categorise sub-samples. Even after this treatment is made, the same respondent may appear in different sub-samples.

2.4 Results and Discussion

In this section, descriptive statistics of the data and nonparametric analysis results are presented first followed by parametric analysis results.

2.4.1 Descriptive statistics

2,134 respondents comprise the sample of this study, of which 50.09% were males. The employment status of these respondents could be any of the following: employed, self-employed or farming. As a respondent's registration status may change during the entire employment period, 72.4% of respondents reported being urban registered in 2008. Table 2-1 illustrates the tabulation of the number of job turnovers respondents had experienced. 39.41% of the respondents had never experienced job turnover while

44.89% of the respondents had experienced job turnover once. The average number of job turnover was 0.82, with a maximum at 7.

Table 2-1 Number of job turnover

Num. of turnover	Freq.	Percent
0	841	39.41
1	958	44.89
2	257	12.04
3	48	2.25
4	20	0.94
5	7	0.33
6	2	0.09
7	2	0.05
Total	2,134	100.00
Mean num. of turnover	0.8201	

Table 2-2 presents at summary of the descriptive statistics. Due to the time-varying characteristics of some variables and multiple employment records for some respondents, columns 1 to 5 report the mean value at the beginning of the first job (this might also be the only job for a respondent). For time-varying variables, mean values at 2008 from the overall sample are also reported for comparison[13]. In column 1, the average age when respondents started their first job was 21.79 and 61.48% of respondents started working after marriage. By contrast, the mean age for the survey year is 35.91. In addition, it can be seen from column 1 and 6 that the proportions in education categories varied[14]. For example, the proportions of respondents having a university education increased from 21.65% to 26.48%. In terms of work-related variables in column 1 of Table 2-2, 59.93% of the respondents' first job was in the public sector. 51.08% of the respondents had contracted job while 64.9% of the respondents' first job had no training. Meanwhile, 54.83% of the respondents' first job

[13] Table 2-2 does not report descriptive statistics of time-constant variables at 2008. The reason is some respondents are unemployed (for example, retired) in 2008. They are unable to report employment situations. In addition, Table 2-2 does not compare descriptive statistics at 2008 from sub-samples. Observations of each sub-sample vary between the beginning of first job and 2008 due to the time-varying character of registration status. Therefore, the descriptive statistics of time-varying variables at the beginning of first job and at 2008 are incomparable.

[14] 38 respondents received education after entering employment.

had any of pension insurance, health insurance or unemployment insurance.

Table 2-2 Summary of descriptive statistics

	Beginning of first job					2008
	Overall	**Urban Male**	**Urban Female**	**Rural Male**	**Rural female**	**Overall**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Demographic						
Age	21.79	21.61	21.42	23.53	21.43	35.91
Married	0.6148	0.6440	0.6667	0.5443	0.5043	0.7882
Party membership	0.1007	0.1741	0.0778	0.0721	0.0116	0.1218
Compulsory education (ref.)	0.3744	0.2304	0.2806	0.6295	0.6638	0.3857
Senior high school	0.3899	0.4359	0.4500	0.2754	0.2638	0.3477
University education	0.2165	0.3141	0.2556	0.0656	0.0522	0.2648
Non-degree qualification	0.0192	0.0196	0.0139	0.0295	0.0203	0.0019
Work-related						
Public sector	0.5993	0.6885	0.7000	0.4459	0.3275	
Labour contract	0.5108	0.6191	0.6042	0.3279	0.2377	
Internal training	0.3252	0.3626	0.3528	0.2459	0.2551	
External training	0.0258	0.0314	0.0250	0.0361	0.0058	
No Training (ref.)	0.6490	0.6060	0.6222	0.7180	0.7391	
Social insurance	0.5483	0.6885	0.6667	0.2820	0.2261	
Obs.	2,134	764	720	305	345	2,134

Note: Only age is a continuous variable while others are dummy variables. The minimum age from column 1 to 5 is 16 while the maximum age is 60, 55, 53, 60 and 54 respectively. The minimum age for column 6 is 18 while the maximum age is 67.

In terms of a comparison between rural and urban respondents, columns 2 to 5 of Table 2-2 shows that urban respondents were better educated than their rural counterparts. For example, around 44% of urban respondents had senior high school education while around 64% of rural respondents had compulsory education. In addition, social insurance participation was significantly higher among urban respondents than rural respondents. For example, 68.85% of urban males had social insurance while this was only 28.2% for rural males.

After reshaping the wide-form dataset into long-form, there are totally 2,987 employment records or observations in the dataset, which means each row represents one or one of employment records of a respondent. In particular, 1,750 of records are uncensored and have a complete employment record, with an average duration at 6.18

years.

2.4.2 Nonparametric analysis

Nonparametric analysis does not make any assumptions about the functional form of the hazard, it is a descriptive analysis. Figure 2-1 and Figure 2-2 present Kaplan-Meier survival estimations. A common feature of these figures is that they all start from one and monotonically decline to zero, indicating that all the jobs must eventually be completed. In Figure 2-1, the left-hand graph illustrates the Kaplan-Meier estimates of two sub-samples by gender, aiming to compare gender differences in the probability of job turnover. Generally, females have a lower survival probability than males, suggesting that females experience more job turnover than males. This gender difference in survival probability is not remarkable until the employment duration is more than ten years. The right-hand graph in Figure 2-1 compares two sub-samples by type of household registration, which illustrates the registration differences in the probability of survival. Urban residents have a higher probability of survival, which means they have stable jobs and are less likely to change them. In contrast to the gender differences, there is a remarkable survival probability difference between urban and rural residents, which may imply that urban and rural residents have different job turnover probabilities in China.

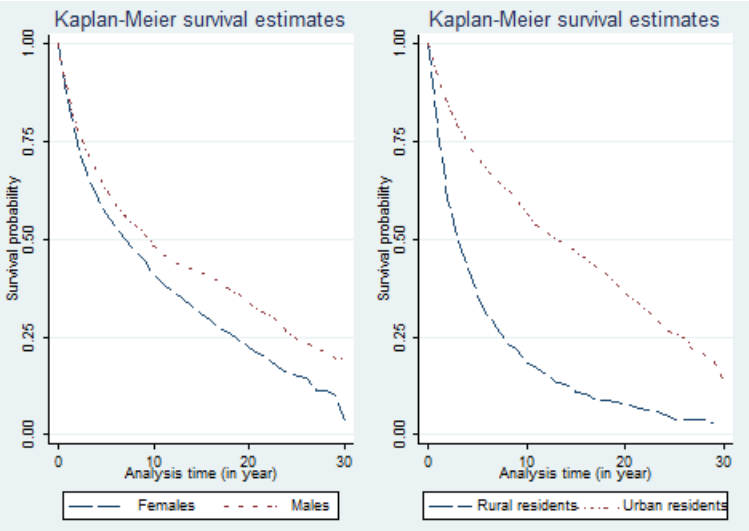

Figure 2-1 Kaplan-Meier estimates by gender and type of registration

In addition, Figure 2-2 shows the survival probabilities controlled by gender and type of household registration simultaneously. In general, urban males have the highest

survival probability, while rural females have the lowest, suggesting that urban males have stable jobs compared to other subsamples. This figure shows that different groups of people have different behaviours in job turnover. Therefore, it is necessary to control for gender and type of household registration simultaneously in the analysis.

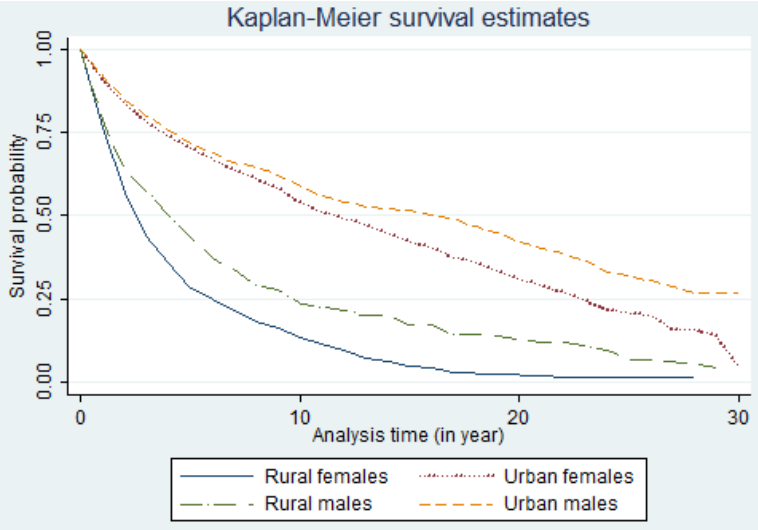

Figure 2-2 Kaplan-Meier estimates by gender and registration simultaneously

Kaplan-Meier survival estimation results support one of the facts stated in Farber's (1999) study that most new jobs end early. Both Figure 2-1 and Figure 2-2 show that survival probabilities decline fastest at the beginning of several years but the trends seem to moderate with the increase in employment spells, implying that most Chinese employees experience job turnover in their early employment and that job turnover probabilities decreases with job tenure.

2.4.3 Parametric analysis

Parametric analysis results are presented in this subsection. Table 2-3 presents the discrete-time survival analysis results for the overall sample. Hazard ratios are reported in the table, which are exponents of the coefficients. To be specific, the first column presents the results without controlling for unobserved heterogeneity in the analysis in comparison to the results in the second column which has such a control. The observations in this table are not the number of respondents, but the number of rows after the dataset expanded into person-period format[15]. The likelihood ratio test for

[15] This explanation applies to other discrete-time survival analysis result tables in this chapter.

unobserved heterogeneity reported in the second column is significant at 1% statistics level. Therefore, the test result shows that unobserved factors among different employment records under the same respondent do exist.

Table 2-3 Discrete-time survival analysis results on the overall sample

	1		2	
	Hazard	**Std. Err**	**Hazard**	**Std. Err**
Baseline				
Sequence	0.9013***	0.0258	1.0789**	0.0390
Sequence squared	1.0061**	0.0028	0.9962	0.0031
Sequence cubed	0.9999	0.0001	1.0001*	0.0001
Demographic				
Male	0.7997***	0.0393	0.7938***	0.0544
Urban residents	0.5609***	0.0325	0.4356***	0.0372
Age	0.9440***	0.0051	0.9274***	0.0067
Age squared	1.0008***	0.0001	1.0010***	0.0002
Married	0.8800**	0.0528	0.8816*	0.0631
Party membership	0.6684***	0.0765	0.5444***	0.0766
Senior high school	1.0247	0.0584	1.0565	0.0847
University education	1.3163***	0.1077	1.4219***	0.1530
Non-degree qualification	1.6530***	0.2106	1.7760***	0.3123
Work-related				
Public sector	0.7457***	0.0399	0.6954***	0.0489
Labour contract	0.7698***	0.0489	0.6899***	0.0562
Internal training	0.9641	0.0561	0.9374	0.0702
External training	0.7587	0.1316	0.6240**	0.1389
Social insurance	0.4358***	0.0300	0.3445***	0.0312
sigma-u			0.8781	0.0647
rho			0.3191	0.0323
Likelihood ratio test:chibar2			113.58***	
Obs.		22,957		

*** 1% ** 5% * 10%

The cubic baseline hazard function serves as the intercept term of the model. It can be seen that when unobserved heterogeneity is controlled for, this duration dependence switches from being negative (column 1) to positive (column 2). Figure 2-3 plots the estimated hazard of the cubic baseline. Consistent with the finding from the nonparametric analysis, this figure also shows that the probability of job turnover is high at the beginning of the job but declines with job tenure. Meanwhile, this result may imply that people are more likely to leave jobs early for unobserved reasons. In addition,

Table 2-3 shows that statistically significant hazard ratios are underestimated when unobserved heterogeneity is not controlled for in the analysis. The estimated residual correlation among the latent responses for the records of the same respondent is 0.3191 (*rho* in output).

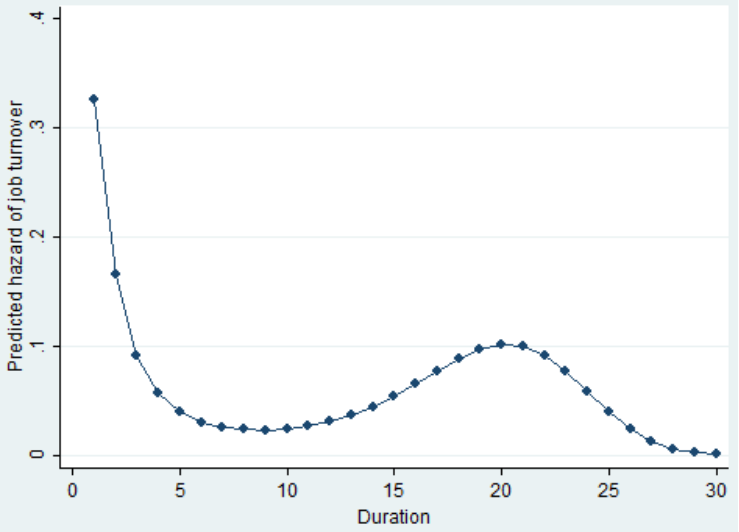

Figure 2-3 Plotted hazard of cubic baseline

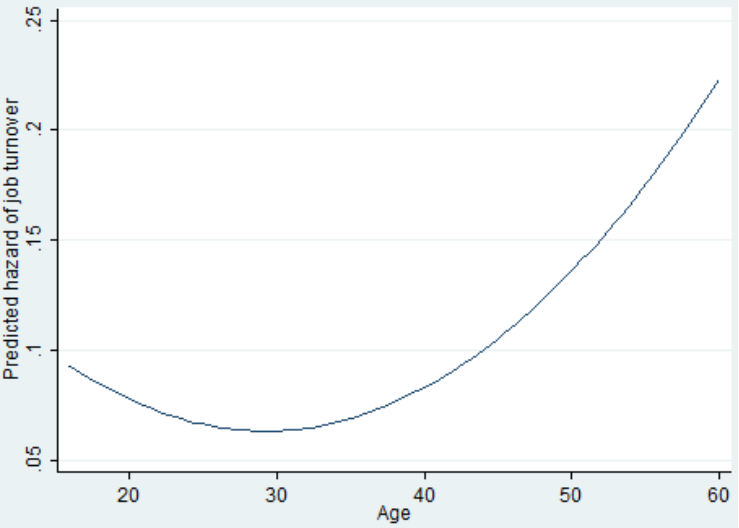

Figure 2-4 Quadratic term of age

In the second column of Table 2-3, when unobserved heterogeneity is controlled for, the hazard ratios of both gender and urban registration status are significant at 1% statistics level. To be specific, when holding all other covariates constant, being male and urban residents have 20.62% and 56.44% lower estimated hazard of job turnover than female and rural residents respectively. The quadratic term of age is plotted in Figure 2-4. It can be seen that the lowest hazard of job turnover occurs at around 30.

Being married and a party member reduce the estimated hazard of job turnover by 11.84% and 45.56%, respectively. Respondents with university education and non-degree qualification experience 42.19% and 77.6% more job turnover respectively compared to those who have compulsory education. In terms of work-related covariates, employees in the public sector have a 30.46% lower estimated hazard of job turnover compared to non-public sector employees. Jobs with a labour contract reduce the estimated hazard of job turnover by 31.01%. Meanwhile, respondents who received external training have 37.6% lower hazard of job turnover than those who never receive training. Jobs with social insurance have 65.55% lower hazard of job turnover.

Table 2-4 Discrete-time survival analysis results by gender

	1		**2**	
	Male		**Female**	
	Hazard	**Std. Err**	**Hazard**	**Std. Err**
Baseline				
Sequence	1.0952*	0.0596	1.0838*	0.0530
Sequence squared	0.9939	0.0046	0.9978	0.0041
Sequence cubed	1.0002	0.0001	1.0001	0.0001
Demographic				
Urban registration	0.4483***	0.0567	0.3981***	0.0484
Age	0.9155***	0.0097	0.9234***	0.0088
Age squared	1.0012***	0.0002	1.0010***	0.0002
Married	0.6866***	0.0744	1.1058	0.1094
Party membership	0.6222***	0.1066	0.4149***	0.1130
Senior high school	1.1561	0.1426	0.9682	0.1046
University education	1.6205***	0.2496	1.2513	0.1964
Non-degree qualification	1.5318	0.3987	2.0266***	0.5015
Work-related				
Public sector	0.7841**	0.0828	0.6277***	0.0605
Labour contract	0.5524***	0.0670	0.8605	0.0962
Internal training	0.8783	0.0992	1.0030	0.1034
External training	0.6140*	0.1707	0.5882	0.2328
Social insurance	0.3719***	0.0493	0.3005***	0.0382
sigma_u	0.9487	0.0992	0.8589	0.0887
rho	0.3536	0.0478	0.3096	0.0441
Likelihood ratio test: chibar2	59.54***		62.11***	
Obs.	11,804		11,153	

*** 1% ** 5% * 10%

Tables 2-4 and 2-5 present the discrete-time survival analysis results by gender and

type of registration respectively. In Table 2-4, it can be found that urban males' hazard of job turnover is 55.17% lower than for urban females', whilst rural males' hazard of job turnover is 60.19% lower than for rural females'. In terms of the quadratic term of age between two sub-samples, it can be seen from Figure 2-5 that the lowest hazards occur at around 30 for both sub-samples. However, males have a lower hazard of job turnover than females at a given age. Being a party member decreases males' estimated hazard of job turnover by 37.78% while it decreases females' estimated hazard of job turnover by 58.51%. In addition, it can be seen from male's sub-sample in Table 2-4 that the estimated hazard of job turnover is 44.76% lower where a labour contract with the employer exist. In the female sub-sample, the estimated hazard of job turnover is 37.23% lower if employed in the public sector. In addition, having social insurance decreases the hazard of job turnover for both males and females, at 62.81% and 69.95% respectively.

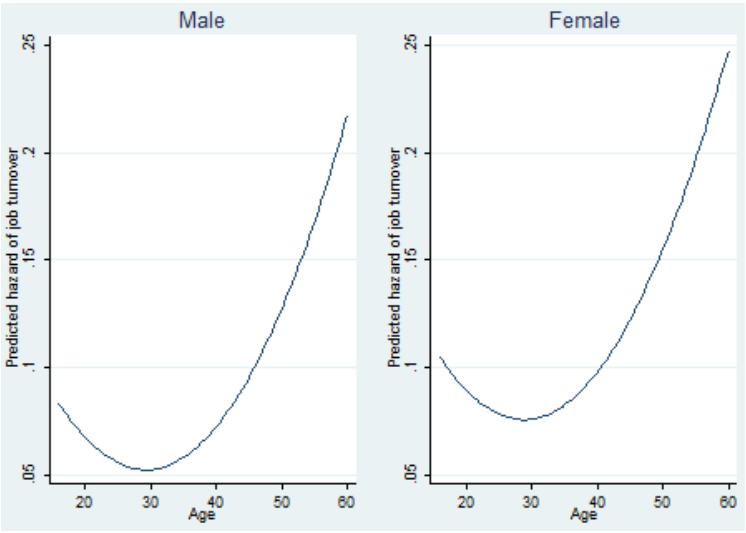

Figure 2-5 Quadratic term of age by gender

Table 2-5 presents the results when urban and rural residents are estimated separately. Urban males' estimated hazard of job turnover is 18.05% lower than that for urban females', whilst rural males' estimated hazard of job turnover is 27.23% lower compared to rural females. Figure 2-6 plots the quadratic term of age, which shows that urban and rural residents have different patterns of job turnover. The hazard of job turnover begins to increase after around 30 for urban residents whilst it keeps decreasing until around 45 for rural residents. Having social insurance reduces the

estimated hazard of job turnover by 71.53% for urban residents whilst it reduces the hazard of job turnover by 44.7% for rural residents.

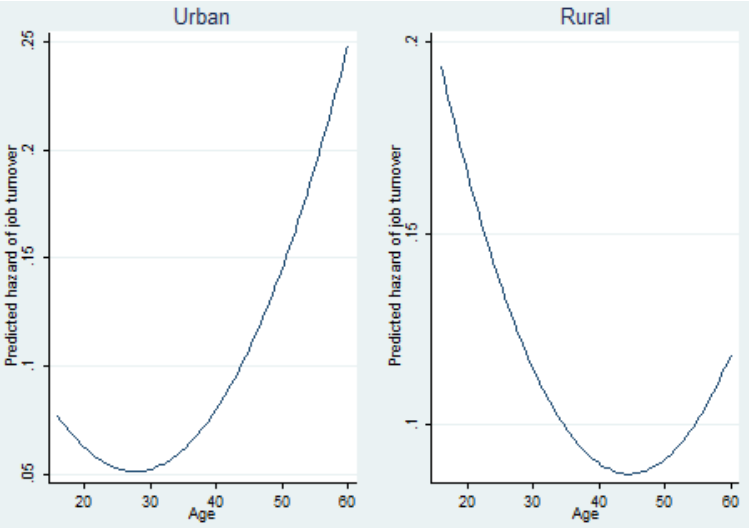

Figure 2-6 Quadratic term of age by registration type

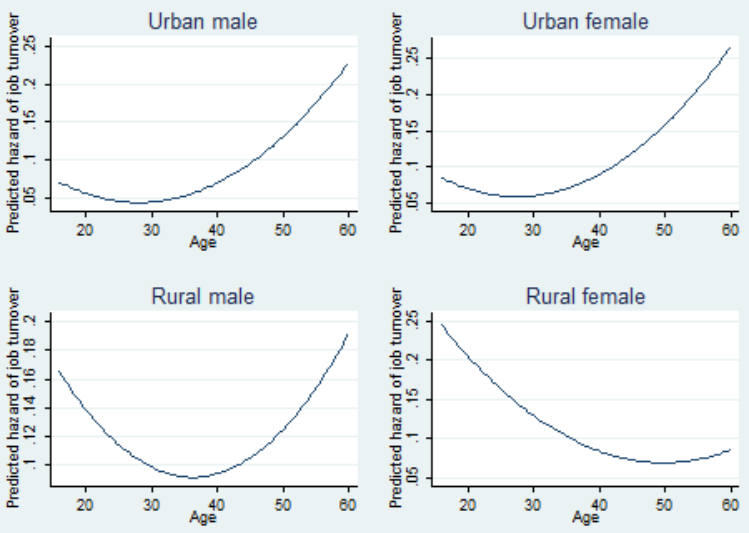

Figure 2-7 Quadratic term of age by gender and registration type

Table 2-6 shows the discrete-time survival analysis results on four sub-samples, which are urban males, urban females, rural males and rural females. The likelihood ratio tests of four sub-sample models are all statistically significant at 1% level, suggesting that controlling for unobserved heterogeneity is necessary in the estimation. Figure 2-7 plots the quadratic age from four sub-samples. A common feature of these figures is that the hazard of job turnover is high at the beginning of a job but it declines with age. Meanwhile, the hazards of job turnover are also high when the age approaches 60, which may imply that people end their jobs due to retirement.

Table 2-5 Discrete-time survival analysis results by type of registration

	1		2	
	Urban		Rural	
	Hazard	Std. Err	Hazard	Std. Err
Baseline				
Sequence	1.0726	0.0484	1.1748**	0.0809
Sequence squared	0.9982	0.0037	0.9891*	0.0065
Sequence cubed	1.0001	0.0001	1.0003	0.0002
Demographic				
Male	0.8195**	0.0708	0.7277***	0.0871
Age	0.8860***	0.0092	0.9145***	0.0107
Age squared	1.0018***	0.0002	1.0008***	0.0003
Married	0.7745***	0.0720	1.2622**	0.1473
Party membership	0.5749***	0.0918	0.4241***	0.1378
Senior high school	1.0214	0.1046	1.1064	0.1483
University education	1.4590***	0.1842	1.4647	0.3808
Non-degree qualification	1.6765**	0.3931	2.0466**	0.5726
Work-related				
Public sector	0.6270***	0.0574	0.8643	0.0982
Labour contract	0.6360***	0.0653	0.8398	0.1148
Internal training	0.9089	0.0869	1.0095	0.1276
External training	0.6466	0.1851	0.5765	0.2146
Social insurance	0.2847***	0.0333	0.5530***	0.0810
sigma_u	0.8929	0.0878	0.9229	0.1089
rho	0.3264	0.0433	0.3311	0.0530
Likelihood ratio test: chibar2	61.29***		47.29***	
Obs.	18,708		4,249	

*** 1% ** 5% * 10%

Moreover, Table 2-6 shows that marital status presents different effects on job turnover among different sub-samples. Marriage reduces the hazard of job turnover by 32.37% for urban males, holding all other covariates constant. The conventional view in China is that husbands should be responsible for outside work while wives should be responsible for domestic work, which means husbands should play the role as bread earners in the family and contribute to a significant proportion of household income (Chau et al., 2007). Therefore, husbands may try to avoid frequent job changes but expect higher earnings from stable jobs. In fact, there is an interactive effect between marriage and husbands' earning (Ahituv and Lerman, 2007). On the one hand, marriage encourages husbands to work longer hours and thus accumulate work experience, which

Table 2-6 Discrete-time survival analysis results for sub-samples

	1		2		3		4	
	Urban males		Urban females		Rural males		Rural females	
	Hazard	Std. Err	Hazard	Std. Err	Hazard	Std. Err	Hazard	Std. Err
Baseline								
Sequence	1.0729	0.0741	1.0920	0.0662	1.1704*	0.1106	1.1906*	0.1266
Sequence squared	0.9962	0.0057	0.9991	0.0049	0.9881	0.0086	0.9918	0.0110
Sequence cubed	1.0001	0.0001	1.0000	0.0001	1.0003	0.0002	1.0002	0.0003
Demographic								
Age	0.8809***	0.0127	0.8763***	0.0130	0.9005***	0.0152	0.9086***	0.0156
Age squared	1.0019***	0.0003	1.0020***	0.0003	1.0013***	0.0004	1.0006	0.0004
Married	0.6763***	0.0929	0.9101	0.1186	0.7985	0.1398	1.8789***	0.3143
Party membership	0.7002*	0.1345	0.4549***	0.1349	0.4822**	0.1774	0.2140*	0.1859
Senior high school	1.1268	0.1712	0.9379	0.1335	1.1697	0.2378	1.0448	0.1967
University education	1.6748***	0.2976	1.2870	0.2401	1.5611	0.5516	1.3275	0.5522
Non-degree qualification	1.3228	0.4280	2.2922**	0.7977	2.0854*	0.9044	1.8236	0.7132

Table 2-6 Discrete-time survival analysis results for sub-samples (continued)

	1		2		3		4	
	Urban males		Urban females		Rural males		Rural females	
	Hazard	Std. Err	Hazard	Std. Err	Hazard	Std. Err	Hazard	Std. Err
Work-related								
Public sector	0.7596**	0.1002	0.5251***	0.0684	0.8646	0.1469	0.8717	0.1407
Labour contract	0.5211***	0.0775	0.7794*	0.1131	0.6729*	0.1366	1.0916	0.2086
Internal training	0.9428	0.1310	0.8923	0.1205	0.8164	0.1554	1.2533	0.2246
External training	0.6736	0.2571	0.5736	0.2534	0.5832	0.2415	0.3910	0.4482
Social insurance	0.2806***	0.0463	0.2691***	0.0453	0.7189	0.1535	0.4007***	0.0854
sigma_u	0.8467	0.1363	0.9573	0.1182	0.9991	0.1607	0.9271	0.1507
rho	0.3036	0.0680	0.3578	0.0568	0.3776	0.0756	0.3432	0.0733
Likelihood ratio test: chibar2	19.71***		45.37***		28.80***		24.95***	
Obs.	9,443		9,265		2,361		1,888	

*** 1% ** 5% * 10%

can substantially increase wage rates. On the other hand, the increase in wage rates may in turn reduce the probability of divorce and job reallocation. By contrast, the estimated result in the third column of Table 2-6 shows that marriage has an insignificant effect on job turnover reduction for rural males. This may imply that rural males are the main income source in the rural households regardless of their marital status, which is consistent with the finding in Zhang and Li (2003).

However, marriage increases the hazard of job turnover for rural females. To be specific, married rural females have 87.89% higher hazard of job turnover than single rural females when other covariates remained constant. The results may suggest that more household responsibilities are added to rural females, which reduces rural females' working hours and leads to an increase in job turnover (Chang et al., 2011).

Being a party member has lower hazard of job turnover than non-party members (Table 2-6). In particular, the hazards of job turnover are 54.51% lower for urban female and 51.78% lower for rural male party members. However, previous studies have found that party members are more likely to move into higher positions or better jobs. Party members may take the advantage of their social network to find better job opportunities and be promoted (Appleton et al., 2009). Therefore, party membership serves the role of collecting more information and accessing a wider social network. However, it does not necessarily mean the title of party member automatically entitles more political capital and economic benefits. Loyalty and political screening are still important for party membership recruitment (Bian et al., 2001)[16]. Only those who are more valuable to the political and economic objectives of the party are likely to be party members (Appleton et al., 2009).

In terms of education, the estimated hazard of job turnover is 67.48% higher for urban males with university education compared with compulsory education. Also, urban females and rural males with non-degree qualification have higher hazards of job turnover. Education can be regarded as an investment in human capital. Therefore, it is generally believed that the probability of job turnover is negatively related to education

[16] In Bian et al. (2001), detailed party recruitment process is described.

(Mincer and Jovanovic, 1981). However, Burgess and Rees (1998) find that post-compulsory educated British people have a shorter employment tenure than other qualifications, which means they are more likely to experience job turnover.

In terms of work-related covariates in Table 2-6, when holding all other covariates constant, urban males and urban females have 24.04% and 47.49% lower hazards of job turnover respectively if employed in the public sector. According to national statistics, although the central government set at a policy to develop a multiple ownership economy in 1984, the proportion of labour force employed in the public economy decreased from 99.6% in 1984 to 58.6% in 2008[17], which still accounting for a significant proportion in the whole economy.

The non-public sector underwent high speed development after the 1978 policy of reform and opening up, which diversified the economy in China and encouraged some state-owned enterprises to be more competitive. The non-public sector makes significant contribution to absorbing labour in China. In particular, the non-public sector provides more job opportunities when the state-owned enterprises reduced their employment scale (Dong and Xu, 2009) and it is currently taking more responsibility for providing employment opportunities.

It is not difficult to understand that employment in the non-public sector is unstable. On the one hand, after the 1997 Asian financial crisis and the 2008 global financial crisis, some export-oriented factories were closed due to low demand globally (Xu, 2010). Female workers employed in these factories may have a greater perception of insecurity and be more likely to lose jobs than their male counterparts (Dong and Pandey, 2012). Therefore, employment stability in some non-public firms is associated with the economic environment. On the other hand, the non-public sector requires employees to have more specific human capital and determines wages by productivity (Appleton et al., 2005). As most of the non-public enterprises are cost-oriented enterprises, they may prefer to recruit efficient and highly skilled employees so that enterprises can employ fewer people in order to save costs. These less productive

[17] Source: 2009 China Labour Statistical Yearbook.

workers are more likely to experience job loss when there is a labour demand decline (Farber, 1993). However, females may also sacrifice time for specific human capital training to child care and domestic work, making them less competitive in non-public employment.

Labour contracts specify the responsibilities and obligations of both employees and employers, protecting the rights of both sides. In Table 2-6, urban males with a labour contract have a 47.89% lower hazard of job turnover, holding all other covariates constant.

Training received from jobs can be regarded as a post-school human capital investment. The implication of Cavanaugh and Noe's (1999) research is that different sources of training may have different functions. On the one hand, internal training may provide opportunities for employers to assess employees' development. On the other hand, employees may use external training as ways of updating their skills, which is necessary as a result of the changing labour market. However, training does not seem to be a significant motivating factor on job turnover among the sub-samples considered in this chapter. Only the hazard ratio of external training in the overall sample is statistically significant at 5% level (Table 2-3, column 2). To be specific, the hazard of job turnover decreases by 37.6% for jobs with external training compared with jobs where no training is offered when holding all other covariates constant. This decrease effect of external training on job turnover can be explained by the commitment perspective of human capital investment. Firstly, external training may contribute to employees' commitment to organisations as it may provide professional skills for employees' career development and increase productivity. If the external training is firm-specific, the effect on job turnover reduction is more significant (Munasinghe and O'Flaherty, 2005). Secondly, employees are more likely to choose firms that offer attractive and practical training opportunities (Green et al. 2000). For these employees, the more training opportunities offered, the more likely they will choose to stay. Longer employment spells can be regarded as a higher commitment to organisations. Thirdly, training involves firms making investment in their workforce. For employees who receive external training funded by employers, they may believe that they are playing

key roles in the organisation and are valued by their employers (Sieben, 2007). In particular, for collectivist organisations in China, employees may have a sense of value and security if employers invest in their career development, leading to a decline in job search intentions.

In general, jobs with social insurance decrease the hazard of job turnover, at 71.94% for urban males, 73.09% for urban females and 59.93% for rural females. All these estimation results on insurance covariates are consistent with the findings in Ellis and Ma (2011), which show that insurance leads to a lower probability of job turnover. The results can also be explained by the search theory, which states that workers always try to maximise utility in the job search process as well as expecting benefits and welfare from jobs (Ehrenberg and Smith, 2009). However, Mealli and Pudney (1996) suggest that insured jobs can attract employees who prefer stable jobs. On the other hand, those who prefer to change jobs frequently may take insurance as a shelter to protect them against any risks associated with job loss. Therefore, the results on insurance should be interpreted cautiously as risk aversion may be another factor determining both insurance participation and job turnover. In addition, employees may suffer from insurance funding loss if they change jobs. Migrant workers in particular, whose insurance may not be transferable when they change employers, may try to avoid job turnover in order to maintain their insurance status (Xu et al., 2011).

2.5 Conclusions

Job turnover became common when China entered into the market economy. This chapter uses discrete-time survival analysis to examine which factors motivate job turnover between urban and rural residents. Both non-parametric and parametric analysis show that most Chinese employees experience job turnover in their early employment and the probability of job turnover declines with job tenure, which is consistent with the finding by Farber (1999). In addition, married urban males have a lower hazard of job turnover while married rural females have a higher hazard. Urban males who have university education have a higher hazard of job turnover.

In terms of work-related variables, urban workers employed in the public sector have a lower hazard of job turnover than urban workers employed in the non-public sector. However, this finding does not apply to rural workers. Employees with social insurance have a lower hazard of job turnover. This conclusion can be found among urban males, urban females and rural females.

Since job turnover is common in the Chinese labour market, it may be necessary to ask whether this is a good or bad thing. On the one hand, job turnover creates mobility in the labour market, making the economy more flexible to adjust to the changing environment. More importantly, job turnover may promote individual's well-being and enable a better job match (Wilk and Sackett, 1996). On the other hand, job turnover is costly for both employers and employees. For employers, they lose investment in human capital, particularly in firm-specific investment, if frequent job turnover occurs among their employees. Therefore, firms may have less incentive to make such an investment. For employees, the consequences of frequent job turnover are short employment length and high emotional strain, which may add to job insecurity perceptions of employees (Swaen et al., 2002).

An implication of this chapter is how employers can design better jobs. In particular, insurance should be purchased for employees if employers want to maintain a long-term relationship. In addition, the labour contract may reinforce a stable employment relationship and training may improve employee' commitment to organisations.

Another policy implication regards the household registration system reform. This system differentiates people from receiving equal benefits and classifies people into urban and rural residents. Therefore, the objective of household registration system reform should not only to be return the right of free mobility to rural registered people, but more importantly to entitle equal rights and benefits to both urban and rural residents. In addition, the function of the household registration system should return to the role of residential management rather than acting as an institutional barrier.

A limitation of the dataset used in this chapter is that the occupation of each employment record is unavailable, which makes it impossible to know what

respondents are actually doing in each job and whether job turnover is associated with a change in occupation. This chapter is a general introduction to the Chinese labour market and points out the influence of the household registration system.

Chapter Three

How Much is Compensated? Wages and Employment Benefits in China

3.1 Introduction

Since 2012, there has been a debate on whether employment benefits should be reduced as the Chinese government at all levels are trying to cut unnecessary and excessive expenses such as travel subsidies and hospitability. For example, moon cakes which used to be given to employees at mid-autumn festival are now cancelled[18]. Employees in the public sector complain about this and argue that austerity should not necessarily mean cancelling benefits. Therefore, in July 2014, the All-China Federation of Labour announced a guideline on offering benefits and stated that benefits should be guaranteed for employees.

Motivated by this debate, it is interesting to examine the relationship between wages and employment benefits in China. To be specific, whether there is a trade-off between wages and benefits. If the answer is yes, when there is a reduction in benefits, wages should be increased in order to keep employees' welfare unchanged. Economically, this can be explained by the theory of compensating wage differentials proposed by Adam Smith. In *The Wealth of Nations*, Smith (1776) stated that "The whole of the advantages and disadvantages of the different employments of labour and stock must, in the same neighborhood, be either perfectly equal or continually tending to equality". His hypothesis suggests that wages should be affected by the "advantages and disadvantages" of the job, which refers to various aspects of work characteristics. An application of this hypothesis in the literature is that when the place of work involves risk, higher wages should be paid to compensate the dangerous working environment. Meanwhile, this hypothesis can be extended to examine the substitution

[18] Xinhua News. Retrieved on 8 November, 2015 from http://news.xinhuanet.com/comments/2014-09/09/c_1112399679.htm

between wages and fringe benefits (Rosen, 1986). These fringe benefits may include various aspects such as lunches and social security contributions. Accordingly, this chapter intends to examine the compensating wage differentials hypothesis from a benefits perspective.

Historically, low wages but generous fringe benefits were paid to employees in China. The low wages could kept prices low and maintained price stability as well as preventing rural people from migrating into urban areas (Cooke, 2004). According to the statistics from the National Bureau of Statistics of China, both the average annual nominal wages and annual real wages of those individuals employed in the urban labour market were low compared with those after 2000 (Figure 3-1 and Figure 3-2). In particular, the average annual real wages increased by approximately 15 times as a result of productivity growth, from 615 yuan in 1978 to 9452.12 yuan in 2014[19].

However, both the wage system and employment benefits have experienced some changes. Initially, a Soviet-style wage system was established in China in 1956. The most significant feature of this was that all employees were paid based on a wage grading system, which is the basic part of the wage that is determined by different grades based on the employee's professional skills (Zhong, 2011). The disadvantages of this wage grading system are obvious. On the one hand, rigid and inflexible wages were unable to effectively motivate employees or reflect differences in performance (Chow, 1992). On the other hand, since wages were compressed and inflexible, returns to education were insignificant and barely differentiated amongst employees (Zhong, 2011). Therefore, a structural wage system was introduced in 1985 to replace this wage grading system. The wages in the new system includes a basic wage, positional pay, seniority pay and a bonus (Chow, 1992; Cooke, 2004). As in the wage grading system, the basic wage was set by the central government and fixed. The bonus, as a floating part of pay, was first introduced into the wage system to reward performance and to differentiate wages. Therefore, this structural wage system put more emphasis on responsibility and performance than on position (Cooke, 2004).

[19] Real wages=nominal wage/CPI, setting 1978 as the base year.

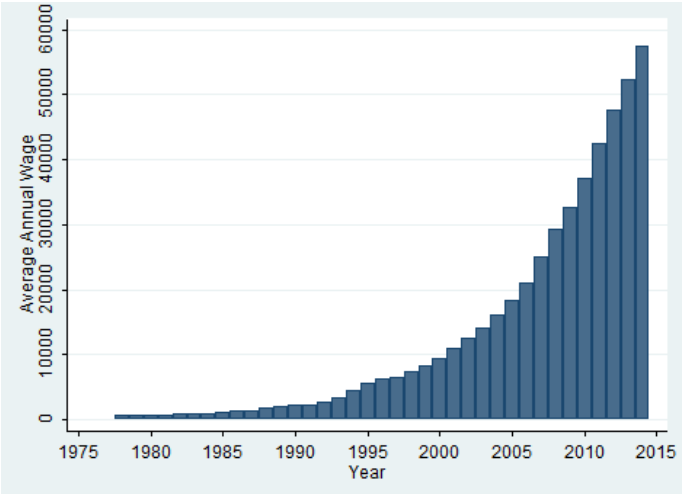

Figure 3-1 Average annual nominal wages of employed

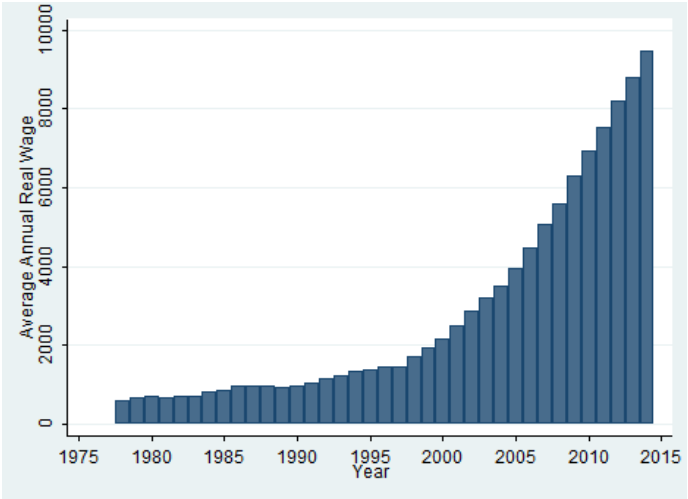

Figure 3-2 Average annual real wages of employed

However, generous in-kind subsidies were provided to employees before the 1990s (Li and Zhao, 2006). The range of in-kind subsidies varies from food such as meat and grains to hygiene products such as soap and toothpaste. The advantages of providing in-kind benefits are, on the one hand, it was an effective way to avoid the strict wage constraints set by the central government in order to compensate for low wages (Li and Zhao, 2006). On the other hand, as the market mechanism did not work well in the planned economy before the 1990s, all products were rationed by the central government and purchasing was completed with coupons. Therefore, providing in-kind subsidies could improve the availability of goods and avoid shortages (Rein et al., 1997). In addition, housing could be regarded as an important in-kind benefit in the public sector before the 1990s, which was free for employees (Wu, 1996).

Since the 1990s, the market-oriented economic reforms have accelerated the

changes in Chinese society as well as its labour market. For example, millions of workers in the state-owned enterprises were laid-off and jobs were not automatically allocated to university graduates in the late 1990s. These changes saw the termination of the "iron rice bowl" or life-long employment in China. This economic transformation also changed the wage system from a centrally-planned system to a market-oriented one (Meng et al., 2013). A basic wage plus a bonus is a common type of wage structure among non-public enterprises. By contrast, in the public sector, the wage payment was divided into a fixed payment and a flexible payment. Particularly, the latter part is closely related to the organisation and individual performance (Cooke, 2004).

Various employment welfare and benefits continuing to be paid to employees but the components of benefits are different in the market-oriented economy. For example, housing reform, began in 1988, has transformed the centrally planned housing system to a market-oriented housing industry. Since then, enterprise-owned houses were either resold to sitting tenants at discounted prices or rented to employees at very cheap prices instead of free provision (Huang, 2003). However, it was not until 1998 that both public and private firms were not allowed to provide subsidised housing. Alternatively, the housing construction fund should be converted into monetary subsidies such as a housing fund to encourage employees to purchase houses themselves.

Another significant change in benefits is the provision of social insurances. Under the system of life-long employment, a Labour Insurance Scheme was implemented in 1951 among employees in the public sector, which mainly covered health, work injury and pension insurance (Rickne, 2013). These social insurances were financed by each enterprise independently and hence employees were not responsible for payment contributions, which had a role as income redistribution to some extent (He and Sato, 2013). However, it was insufficient for social insurance to cover public sector employees only. With the development of a non-public sector in the market economy, an employer-based social insurance system was established in the late 1990s to cover all employees in urban China (Giles et al., 2013)[20], which is operated and managed socially

[20] The social insurance system covers employed, self-employed and informally employed people in urban China. For details of the social insurance system introduction and how each component works, see Giles et al. (2013).

rather than by enterprises themselves. There are five types of insurance in this system, including pension, unemployment, health, work injury and maternity (females only) insurance. Both employers and employees need to financially contribute to insurance payments except work injury and maternity insurances[21]. In addition, with a housing fund, these five social insurances and one fund have become an important part of employment benefits.

Overall, the above changes in the wage system suggest that the wage payment is shifting from being rigid towards more flexibility. Wages are always paid with different employment benefits in the Chinese urban labour market. However, the quick growth of the non-public sector and export-oriented economy since the 1990s not only brought diversity to the urban labour market, but also attracted a large amount of rural people into cities to work and live (Meng et al., 2013), forming at population of migrant workers. They are engaged in manufacturing, construction and service work in cities, making a great contribution to China's economy development. Therefore, when examining the compensating wage differentials hypothesis, migrant workers should also be considered as they are an integral part of the workforce in the urban Chinese labour market. However, they may have different expectations and concerns about employment benefits due to their rural registration status. For example, as a housing benefit, shared dormitories are commonly provided to migrant workers (Lin and Zhu, 2010). Moreover, as a result of their rural registration status, migrant workers are excluded from many economy housing programmes, such as public rental houses (Li and Zhang, 2011; Lin and Zhu, 2010). Therefore, shared dormitories are expected by migrant workers and provided as an employment benefit. In addition, although migrant workers employed in urban areas are encouraged to participate in social insurance, a lack of specific policy guidance may result in at low participation rate. Meanwhile, pension and health insurances' funding accumulations may not be transferable when migrant workers move to other cities or return to rural hometowns, which may reduce their incentives to participate in social insurance as well (Giles et al., 2013).

[21] Only employers are required to financially contribute to work injury and maternity insurances.

According to the background given above, it can be concluded that Chinese firms have the practice of paying both wages and providing employment benefits to employees. In particular, generous benefits were paid to employees to compensate for low wages before the 1990s, which is consistent with the compensating wage differential hypothesis. However, after the 1990s, benefits were still paid to employees even if there was an increase in wages. Therefore, the objective of this chapter is to examine whether benefits still play a compensating role to wages in China, meaning whether there is a trade-off between wages and benefits based on the compensating wage differentials hypothesis.

The 2009 Rural-Urban Migration in China (RUMiC) dataset provides information on wages and benefits of both urban and migrant respondents. It can be employed to examine the trade-off between wages and a range of benefits, which includes bonuses, housing subsidies and social insurances. Bonuses are an important source of income to supplement low wages in China, particularly in sectors such as government where wages are controlled or companies where low basic wages are set (Hu et al., 1988; Cooke, 2004). Although the payment of housing subsidies is declining among urban people, it is still an important benefit for migrant workers. By contrast, social insurances are required to provide to all employees. Therefore, it is necessary to examine whether these benefits are acting as a compensating role to wages.

The organisation of this chapter is as follow, the next section presents a literature review for this topic. Section 3.3 gives the data and methodology while Section 3.4 shows the results and the discussion for the results. Concluding remarks will be presented in the Section 3.5.

3.2 Literature Review

This section presents a summary of studies on compensating wage differentials.

3.2.1 Fundamental studies

Rosen (1974) develops Smith's (1776) idea and proposes a hedonic wage model, which is an application of the compensating wage differentials hypothesis. In his model,

equilibrium is met when an employee's indifference curve on the probability of risk and wage is at a tangent with employer's isoprofit curve which contains various combinations of risk and wages. The risk is positively related to the wages while being negatively related to employer's profit. Therefore, the hedonic wage model suggests that higher risk is associated with higher wages. The employers' goal is to find the optimal wage level which compensates for the risk involved in jobs.

However, empirical studies on compensating wage differentials present inconsistent results. Both Brown (1980) and Duncan and Holmlund (1983) emphasise the importance of using panel data to examine the wage compensating effect of working conditions. They argue that the determinants of earning capacity such as working experience may change over time. Therefore, it is necessary to control for both time-varying individual and job characteristics in the analysis, which is able to reduce the omitted variable bias and provide consistent estimation results. Using a seven year panel dataset from the 1966-1971 and 1973 US National Longitudinal Survey young men's section, Brown (1980) fails to find such a trade-off even time-constant individual specific variables are controlled for in the analysis. Duncan and Holmlund (1983) explain Brown's (1980) failure to use working condition variables from independent sources rather than respondents' self-reported variables. Therefore, they employ data from the 1968 and 1974 Swedish Level of Living Survey to examine the trade-off between wages and working conditions, in which the working condition variables are self-reported. They find that the wage compensating effect of the dangerous working conditions can be found when using two years' data to undertake a panel analysis while not in the cross-sectional estimation.

3.2.2 Benefits as exogenous variables

Leibowitz (1982) examines the trade-off between wages and fringe benefits in the US. Her descriptive statistics from the 1978 Health Insurance Survey suggest that there are gender and race differences in receiving fringe benefits. Leibowitz (1982) further estimates a logarithm of hourly wage equation with respect to fringe benefits. These benefits include vocation, sick leave, accident insurance, life insurance and health insurance. However, a trade-off between wages and fringe benefits is not found. She

argues that this is probably because both wages and fringe benefits increase with job tenure. Therefore, unobserved employer-specific characteristics which do not change over time in this cross-sectional analysis may bias the estimation results.

Previous studies on the wage and pension trade-off mainly focus on the spot labour market, which is to examine the trade-off between annual wages and annual pension. However, Montgomery et al. (1992) argue that pension contributions may vary with employment tenure. Therefore, they extend the spot model to a life-time model of the labour market by examining the expected present values of wages and pension. Using data from the 1983 US Survey of Consumer Finances, a trade-off between wages and pension is found in both models when applying OLS, but the magnitude of the trade-off is larger in the life-time model than in the spot model. In addition, Montgomery et al. (1992) employ pension specific and firm specific instruments to correct for the omitted variable bias in the OLS estimation[22]. However, an insignificant pension coefficient is obtained, which suggests that OLS estimations may be more efficient.

Montgomery and Shaw (1997) argue that firm size and union presence may affect pension payment to workers. However, as the 1983 Survey of Consumer Finances is a cross-sectional dataset, using OLS may be unable to capture the omitted variable bias as well as unobserved attributes which may affect union selection and income. Therefore, they apply the Heckman two-step model to correct for union selection bias. They firstly build a multinomial model to compare respondents employed in union firms, non-union small firms (base category) and non-union large firms. And then the wage equation results show that the wage and pension trade-off is greater in large non-union firms than other firms.

Fringe benefits not only have a wage compensating role, but also have an incentive role, which may increase workers' productivity. Amuedo-Dorantes and Mach (2003) use the fixed effect estimation to solve the problem of the non-random assignment of workers into jobs providing certain types of benefits. Employing data from the 1988-1998 US National Longitudinal Survey of Youth, their results show that

[22] Instrumental variables used in this study are presented in Table 3-1.

performance-based pay schemes such as bonuses are associated with higher wages while wages are reduced in exchange for fringe benefits such as insurance. In addition, gender differences in performance-based pay and fringe benefits are observed, suggesting that males and females may have different risk attitudes and preferences towards non-wage benefits.

In addition, providing fringe benefits can reduce job turnover. Employing Norwegian data, Dale-Olson (2006) finds that firms offering high wages and generous fringe benefits experience a significant reduction in job turnover. A trade-off between wage and fringe benefits is not found in this study, which suggests that firms offering high wages also offer generous fringe benefits.

The neoclassical labour market theory implies that employer may adjust fringe benefits in response to minimum wage changes. Simon and Kaestner (2004) use the 1980-2001 US Current Population Survey to study the relationship between the minimum wage and fringe benefits. Three different types of insurances (employer provided health insurance, family coverage insurance and employer fully paid insurance) and a pension are included in the fringe benefits package. Their OLS estimation results suggest that the minimum wage has no impact on the provision of fringe benefits among different education groups.

Overall, two conclusions can be drawn from the above literature. Firstly, employment benefits not only have the function of compensating the wages, but are also able to motivate employees and reduce job turnover. Secondly, in terms of the methodology, using OLS may not justify the compensating wage differential hypothesis. However, the results approach expectations if panel data analysis is used or the selection bias is corrected for in some studies.

3.2.3 Benefits as endogenous variables

In this subsection, benefit variables are treated as endogenous variables. Instrumental variables are selected to correct for the endogeneity problem. Table 3-1 lists the instruments used in these studies.

Perloff (1991) studies the housing condition of American hired agricultural workers and the wage compensating effect of free housing. He firstly uses a selection

model for the choice of housing and finds that a quarter of hired agricultural workers live in rent-free housing. Then, as living in rent-free housing is an endogenous variable in the wage equation, two-stage least squares (2SLS) is applied to correct for the endogenous variable problem in the wage equation, with the probability of living in rent-free housing as an instrument. However, the results show that workers living in rent-free housing earn higher wages than others, meaning a trade-off between wages and free housing is not found. Perloff (1991) explains this as due to the low quality of rent-free housing, so the value of housing itself is insufficient to compensate the wage.

Table 3-1 Instruments used in the literature

Authors	IVs
Artz (2010)	Whether the respondent or respondent's spouse has other sources of income besides formal job.
Bolvig (2005)	Manual workers:fraction of white-collar workers interacted with the Confederation of Danish Employers (DA), dummy for 4-20 employees interacted with DA, and dummy for 20-100 employees interacted with DA White-collar workers: fraction dummy for 20-100 employees interacted with DA of white-collar workers interacted with DA, share of males interacted with DA, and dummy for 20-100 employees interacted with DA
Daneshvary and Clauretie (2007)	Spouse's firm size, whether the spouse's insurance plan covers family.
Jensen and Morrisey (2001)	Other income, spouse employment dummies, spouse health condition dummies
Montgomery et al. (1992)	The wage replacement ratio, vesting status, firm size, 3-digit industry capital-labour ratio, tenure.
Olson (2002)	Husband's firm size, husband's union status.
Perloff (1991)	Probability of live in rent free housing.
Zimmer (2009)	Spouse's firm size, spouse's union status, whether spouse is employed in a government job, industry dummies and whether spouse's firm has multiple locations.

Jensen and Morrisey (2001) also emphasise the importance of treating fringe benefits as endogenous variables because it depends on both the firms' profit maximisation and workers' utility maximisation targets. They estimate the magnitude of the trade-off between wages and fringe benefits among older American workers using the 1994 and 1998 Health and Retirement Survey. They argue that OLS underestimates

the wages offset by health insurance. Therefore, Jensen and Morrisey (2001) firstly apply OLS to regress each fringe benefit (health insurance, pension plan and vacation weeks) with respect to all exogenous variables and spouse's health condition indicators. Then they use 2SLS to correct for the endogenous variable problem in the wage equation with spouse's employment and spouse's health condition as instruments. They find that when taking account of the endogenous variable problem, annual wages for older workers would be around 6,300 US dollar lower if health insurance was provided to them, which is approximate to their annual health consumption.

Bolvig (2005) incorporates the concept of corporate social responsibility to examine the trade-off between wages and fringe benefits amongst Danish employees. An index of concern levels is computed to measure the level of fringe benefit concern. Because unobserved factors such as ability and job specifications may affect the concern level index, this index should be treated as an endogenous variable in the wage equation. To correct for the endogenous variable problem, the predicted value of the index is obtained by regressing with exogenous variables and job specific instruments. Next the endogenous index variable in the wage equation is replaced by its predicted value. The OLS estimation results show that the compensating wage differentials hypothesis may not hold for white-collar workers as they get both higher wages and better fringe benefits.

Some studies have focused on the trade-off between wages and health insurance. For example, Olson (2002) notices that previous empirical studies on compensating wage differentials may give biased results. Therefore, in his study on the trade-off between wage and employer provided health insurance among full-time employed wives in US, two instruments related to health insurance provision while unrelated to unobserved factors affecting wages are introduced. The first instrument is husband's firm size. The argument for choosing this instrument is that smaller firms are less likely to purchase health insurance for employees because of the economies of scale. The second instrument is the husband's union status. This is because union members receive more fringe benefits compared with other non-union members. 2SLS is applied to estimate the logarithm wage equation. The results show that wives receive 20% lower

wages in return for employer provided health insurance. Olson (2002) further estimates the market value of health insurance and finds that the estimated substitution value between the wage and insurance is approximately equal to the health care costs consumed by respondents.

Daneshvary and Clauretie (2007) extend Olson's (2002) research by examining married men and women separately to investigate the differential in employer provided health insurance compensation. One of their models is the natural logarithm of annual earnings conditional on own health insurance. The other is the probability of having own health insurance which depends on the probability of the spouse having health insurance. In order to correct for the omitted variable and endogeneity biases of own health insurance status in the simultaneous estimation, the spouse's firm size and whether the spouse's insurance plan covers family are selected as instrumental variables in the 2SLS estimation. With data from the 2001 US Medical Expenditure Panel Survey, the estimation results show that the wage and health insurance trade-off for married men and women are 16.5% and 20% respectively. Therefore, there is a 3.5% gender differential for this trade-off and married women are willing to trade-off higher wages in return for health insurance.

In addition, Zimmer (2009) studies the substitution of employer provided health insurance among married couples in the US. He firstly examines whether the availability of employer provided health insurance affects the probability of spouses having the same insurance. In the probit simultaneous estimation, a binary variable of respondent's own insurance status is estimated with respect to spouse's insurance status and demographic variables. The spouse's firm size, union status and whether employed in a government job are used as instrumental variables to correct for the endogenous spouse's insurance status variable. The simultaneous estimation results show that if the respondent is insured, the spouse is approximately 6-7% less likely to have health insurance. When examining the trade-off between wage and health insurance for husbands and wives separately, a binary variable representing whether the husband and wife are in a separate insurance plan is added to the wage equation. To correct for the endogeneity problem of this binary variable, Zimmer (2009) uses the spouse's firm size,

union status, industry dummies and whether the firm has multiple locations as instrumental variables in the estimation. He concludes that wages are substituted if insurance is shared by the couple in the household.

Artz (2010) empirically examines the relationship between fringe benefits provision and job satisfaction. Using five waves of the 1996-2004 National Longitudinal Survey of Youth, he realizes the endogenous problem of fringe benefit variables after conducting pooled cross-sectional and conditional logit estimation. Therefore, a recursive bivariate probit model is built to correct for the endogenous variable problem. On the one hand, fringe benefits are determinants of job satisfaction. On the other hand, fringe benefits are decided by some unique factors, which are called instrumental variables. Eight dummy variables representing each specific fringe benefit and eight dummies representing the minimum number of fringe benefits are dependent variables for the fringe benefit equations respectively. His estimation results show that fringe benefits have a positive impact on job satisfaction and the endogeneity may not be a problem when using panel data. One limitation of Artz's (2010) research is that in order to have a consistent type of the error terms in the simultaneous estimation, the ordinal job satisfaction variable has to be transformed into a binary variable, which sacrifices the ordinal characteristic of the job satisfaction variable.

In conclusion, the implications of the above literature suggest that benefit variables should be treated as endogenous variables in the estimation, which may give unbiased results compared with treating them as exogenous variables in the wage equation. The underlying endogeneity concern is that more productive workers will receive both higher wages and higher benefits. Therefore, instrumental variables should be selected to correct for the endogenous problem of benefit variables. In particular, spousal instrumental variable should be selected as it may only have an impact on a respondent's own benefits but may also be uncorrelated to the respondent's wages.

3.2.4 Employment benefits research in China

Fringe benefits can help to motivate and retain employees. Chiu et al. (2002) use two case studies to compare the compensation preferences between employees in Hong Kong and mainland China. In terms of retaining employees, those in Hong Kong prefer

mortgage loans while employees in China prefer housing provision, both of which can satisfy the employees' basic living and security needs. Meanwhile, employees would be motivated if profit sharing and annual leave are provided to Hong Kong employees while Chinese employees are motivated by individual bonuses and overtime working compensation. These differences are not only attributed to economic and geographic differences, but also cultural differences between Hong Kong and mainland China.

Li and Zhao (2006) present a study on in-kind benefits in China. They analyse Chinese household survey data and find that in-kind payments were prevalent in the 1980s but declined in the 1990s. The explanations for these changes are, on the one hand, consumer products have become easier to buy with cash since the 1990s. On the other hand, as wage payments in the public sector were strictly regulated by the government in the 1990s, a significant proportion of in-kind payments were made to employees to compensate for low wages. Li and Zhao (2006) use the logit model with the in-kind payment status as the dependent variable and find that workers employed in the public sector receive a higher proportion of in-kind payments than other sectors. Within the public sector, government officials and enterprise managers receive more in-kind payment than other workers, which supports the view that in-kind payments supplement wages in the public sector. In addition, the decline in the profitability of enterprises may be a reason for a decrease in in-kind payments in the 1990s as well.

Using 2005 China Urban Labour Survey, Lee (2012) studies wage discrimination between urban and migrant workers. He not only uses Oaxaca-Blinder to decompose the wages between urban and migrant workers, but also decomposes the total value of a compensation package which includes earnings, annual bonus and employers' contribution to insurance. The dependent variables in the two wage equations are the logarithm of hourly wage and logarithm of hourly compensation respectively. Lee's (2012) decomposition results suggest that urban workers receive both higher wages and compensation compared with migrant workers. In addition, the results show that most migrant workers are not fully compensated by social insurances.

An important piece of empirical research on compensating wage differentials in China is conducted by Frijters et al. (2010), employing data from the 2008 Rural-Urban

Migration in China (RUMiC). The objective of their study is to compare a remuneration package between urban and migrant workers in China. This remuneration package includes social insurances for both urban and migrant workers and additional in-kind payments (meals and housing) for migrant workers only. Although the questionnaire does not ask the specific value of social insurances contribution by employers, Frijters et al. (2010) calculate the value of social insurance contributions based on the mandatory level of employers' contributions in respondents' working cities. However, the disadvantage of this approach is that they need to assume that employers have fully complied with the social insurance obligations and that there is no reduction in the contribution. Their descriptive statistics show that urban workers not only earn higher annual and hourly wages compared with migrant workers, but they also get more benefits. They use OLS to regress the hourly wage of urban and migrant workers respectively with respect to insurance dummies, and find that the trade-off between hourly wages and insurances cannot be justified. Their argument for this finding is that wages and insurances are proportionally related in China.

3.2.5 Summary and contributions

According to the literature summarised above, empirical studies on compensating wage differentials are uncommon in the Chinese literature. Most Chinese studies focus on the determinants of benefits rather than examining the trade-off between wages and benefits. Meanwhile, both Lee (2012) and Frijters et al. (2010) incorporate migrant workers into the analysis, which suggests that migrant workers are an integral part of the workforce in the Chinese urban labour market. In terms of methodology used in the literature, although the importance of using panel data analysis has been argued by the literature, it is not commonly used in the empirical studies. Alternatively, 2SLS is feasible when benefit variables are endogenous in the wage equation. However, the efficiency of 2SLS may be reduced when endogenous variables are in different types. An example of this case is Artz (2010). In addition, spousal and firm level instruments are used in the literature. In particular, firm level instruments may need to be obtained from independent sources rather than the dataset itself.

The contributions of this chapter to the literature take three main forms. Firstly, a

package of employment benefits is identified from the 2009 RUMiC to examine whether there is a substitution effect between wages and benefits. This chapter is different to Frijters' et al. (2010) compensating wage differentials research in that it considers a package of benefits rather than only insurances. The second contribution is that benefit variables are treated endogenously in the wage equation, which could offer unbiased estimation results and seems to be absent in the Chinese literature. To correct for the endogeneity problem of the benefit variables, instrumental variables are selected. The final contribution is that the conditional mixed process estimation is applied to a compensating wage differentials study, which is able to accommodate different types of dependent variable in the simultaneous estimation and has not been previously applied to studies of this topic.

3.3 Data and Methodology

Data from the Chinese part of the Rural-Urban Migration in China (RUMiC) are employed in this chapter. The RUMiC is a collaboration project among the Australian National University, Beijing Normal University and the Institute for the Study of Labor (IZA). The project is financially supported by the Australian Research Council, the Australian Agency for International Development (AusAID), the Ford Foundation, IZA and the Chinese Foundation of Social Sciences. The objective of this joint project is to investigate the migrant population in China and its changing labour market. Seven consecutive waves of this panel project have been conducted. However, only two waves (2008 and 2009) are publicly available when preparing for this chapter.

One of the sub-surveys used in this chapter is the 2009 Urban Household Survey (UHS), where the respondents are registered and living in urban areas at the time of the survey. The 2009 UHS includes 5,000 urban households living in 19 Chinese cities[23], containing detailed information on individual and household characteristics. In particular, the questionnaire asked the wage earners *what is your average monthly*

[23] These 19 cities are Anyang, Bengbu, Chengdu, Chongqing, Dongguan, Guangzhou, Hangzhou, Hefei, Jiande, Leshan, Luoyang, Mianyang, Nanjing, Ningbo, Shanghai, Shenzheng, Wuhan, Wuxi, Zhengzhou.

income from current primary job. It further asked *how much is the average monthly wage* and *how much is the average monthly bonus* for this job. Another sub-survey used in this chapter is the 2009 Migrant Household Survey (MHS), where the respondents are defined as people who live and work in cities when interviewed but are registered in rural China. The MHS interviewed 5,000 migrant households in 15 cities[24]. The same income questions were asked to migrant respondents. However, the 2008 UHS and MHS did not ask further questions about wage and bonus values after asking average monthly income questions. Therefore, only data from the 2009 UHS and MHS are combined for a cross-sectional analysis in this chapter.

Due to the fact that migrant workers move quite frequently and it is difficult to track their movement, interviewers went to the place of work of migrant workers to conduct interviews, which may also be the migrant workers' living place. The most common type of accommodation for migrant workers is shared dormitories near their place of work provided by employers for free or at low cost as an employment benefit (Akgüç et al., 2014). By contrast, urban respondents are less mobile and can be tracked by visiting their homes in each interview. Therefore, the MHS sampled respondents based on their place of work while the UHS sampled respondents based on an individual address (Akgüç et al., 2014).

Even though the MHS uses this unique sampling method, the attrition problem is significant between the 2008 and 2009 waves. To be specific, 58.4% of the respondents disappeared after the 2008 interview (Akgüç et al., 2014). Therefore, a significant number of migrant workers were newly selected in the sample of 2009 MHS. This means that, in the 2009 MHS, a group of individuals were interviewed in both 2008 and 2009 (old sample) whilst a group of individuals were only interviewed in 2009 (new sample). By contrast, the attrition rate is 5.8% for the UHS (Akgüç et al., 2014).

The value of monthly housing subsidies was asked in both UHS and MHS. In addition, the questionnaires provide information on social insurances. For instance, the

[24] These 15 cities are Bengbu, Chengdu, Chongqing, Dongguan, Guizhou, Hangzhou, Hefei, Luoyang, Nanjing, Ningbo, Shanghai, Shenzhen, Wuhan, Wuxi and Zhengzhou. Akgüç et al. (2014) provide detailed sampling size information of this dataset.

questionnaires asked all respondents if unemployment insurance was paid by employer, respondent or both employer and respondent. Similar questions were asked for pension, injury insurance and housing fund. Therefore, bonuses, housing subsidies and social insurances are a range of compensations for wages.

$$\ln Wage = \alpha_0 + \alpha_1 Per + \alpha_2 Emp + \alpha_3 \ln Bonus + \alpha_4 \ln House + \alpha_5 Ins + \varepsilon_1 \quad (3\text{-}1)$$

$$\ln Bonus = \beta_0 + \beta_1 Per + \beta_2 Emp + \beta_3 IV + \varepsilon_2 \quad (3\text{-}2)$$

$$\ln House = \gamma_0 + \gamma_1 Per + \gamma_2 Emp + \gamma_3 IV + \varepsilon_3 \quad (3\text{-}3)$$

$$Ins = \phi_0 + \phi_1 Per + \phi_2 Emp + \phi_3 IV + \varepsilon_4 \quad (3\text{-}4)$$

The average monthly wage asked in the two sub-surveys can be regarded as the wage without any additional compensation. Therefore, the natural logarithm of monthly wages, ln*Wage*, with respect to three endogenous benefit variables can be built to empirically examine the compensating wage differentials hypothesis (equation 3-1). The exogenous variables can be put into two groups, one for personal characteristics (*Per*) and the other for employment characteristics (*Emp*). In the personal characteristics group, working age is set at between 16 and 60. For the highest level of education respondents completed, it can be categorised into five groups: never been to school (base category), elementary school, junior high school, senior high school and higher education[25]. Secondary school is included in the senior high school category while polytechnic college is added to the higher education category.

In the employment characteristics group, job tenure in year is the difference between the survey year and current job start year. Primary occupation was asked in both sub-surveys but different occupation codes are defined. Generally, primary occupation can be put into four categories. The first occupation category is management positions, which acts as the base category in the estimation. The second occupation category is service personnel while the third category is respondents employed in the agriculture and manufacture sectors. Other occupations such as self-employed are classified as other occupations. In addition, a binary variable is generated for

[25] For the old sample respondents, their highest education level should be obtained from the 2008 wave.

employment in the public sector. Firm size is a continuous variable in the UHS while it is a categorical variable in the MHS. In order to coordinate the differences between these two sub-surveys, firm size is coded as categorical variables. The first category represents firms employed less than 5 employees, which is the base category. The second category is for firm size between 6 and 50. The third category is for firms employing more than 50 employees.

Coefficients from α_3 to α_5 in equation 3-1 are for endogenous benefit variables. According to the compensating wage differentials hypothesis, wages may be reduced if generous benefits are paid to employees, meaning that there is a trade-off between the wages and benefits. Therefore, these three coefficients are hypothesised to be negative. In order to correct for the endogenous variable problem, some instrumental variables should be introduced. These instruments should be highly correlated with each benefit variable but uncorrelated with the wage. Therefore, equations 3-2, 3-3 and 3-4 are built with respect to each benefit variable as the dependent variable, estimated with all exogenous variables and instrumental variables which are represented by *IV*.

Equation 3-2 is the bonus equation, where the dependent variable is the natural logarithm of monthly bonus, ln*Bonus*. As 55.85% of respondents who did not benefit from bonus were coded as 0 in the dataset, this equation can be estimated by the Tobit model with a left censored bonus value.

The dependent variable of equation 3-3 is the natural logarithm of monthly housing subsidies, ln*House*. In the 2009 UHS, the questionnaire directly asked the average monthly value of housing provided or subsidised by firms. By contrast, in the 2009 MHS, more detailed housing questions were asked. In terms of the housing value from the migrant sample for this equation, if free accommodation is provided to respondents, then the sum of respondents estimated value of accommodation and the additional subsidies if applicable are treated as the value of housing. If accommodation is not provided but subsidised to respondents, the subsidised value is treated as housing compensation. 73.31% of respondents who did not benefit from housing subsidies were coded as 0 in the dataset. This equation is appropriate to be estimated using Tobit model with a left censored housing value as well.

Equation 3-4 is the insurance equation. The number of employer fully paid or mutually paid insurances is generated as the dependent variable for this equation, *Insurance*. Both Estrin et al. (1997) and Llius and Abraham (2013) treat the number of benefits as an ordered dependent variable and argue that the utility increases with an additional benefit. Therefore, equation 3-4 can be estimated by the ordered probit model.

The above simultaneous models are equations with uncensored (equation 3-1), left censored (equation 3-2 and equation 3-3) and ordered (equation 3-4) dependent variables. Equation 3-1 can be regarded as a structural equation while equations 3-2 to 3-4 are reduced form where exogenous and instrumental variables are included in the right-hand-side of these equations. Therefore, the conditional mixed process (CMP) estimator developed by Roodman (2011) can be applied to jointly estimate the four equations. CMP's framework incorporates commonly used econometric models, which means it gives flexibility in model construction and can accommodate different types of dependent variables in the simultaneous estimation. In the case of this chapter, the estimation of CMP is limited-information maximum likelihood.

Instrumental variables should be selected to correct for the endogenous problem. The literature suggests that risk averse people are less likely to take a job with a bonus element as bonuses are performance pay and may vary with the job while people who like to take risks may prefer jobs with more flexible payments and uncertainty (Bonin et al., 2007; Grund & Sliwka, 2010; Cornelissen et al., 2011). Therefore, general risk attitude is used as an instrumental variable. Both sub-surveys asked respondents their general risk attitudes, ranging from 0 which is never take risks to 10 which is very likely to take risks. The consistency and validity of self-reported general risk attitude is verified by Dohmen et al. (2011) where a field experiment is undertaken to confirm that the subjective risk attitude measurement is highly consistent with risk attitudes obtained from a lottery game.

In terms of the 11-scale risk variable in this chapter, it can be coded into three categories. 0 representing a group of respondents who never take risks, which is the reference category. Risk attitude levels from 1 to 3 are coded as the second category,

which can be regarded as respondents who have low level of risk attitude[26]. Finally, risk levels from 4 to 10 are coded as the high risk attitude group[27].

Another instrument is a binary variable for whether the respondent has no more than one child, which could be either zero or one child[28]. Ebenstein and Leung (2010) study the son preference in rural China and find that parents without sons wish to participate in pension programmes and have higher savings. This suggests that sons take the responsibility of taking care of elderly parents in rural China. In addition, Song (2014) conducts case studies on pension participation among families who lost their only child in urban China, which finds that having a pension is an important financial income source for parents who have lost children. Therefore, both studies suggest that having children may be a significant factor encouraging adults to participate in social insurance. In particular for China, the one-child policy allows each couple to have only one child. If this only child is lost, it is disastrous for the family.

Taking advantage of the household characteristics of the RUMiC, a spousal instrumental variable can be generated, that is whether spouses have experienced involuntary job loss before. The purpose of setting up unemployment insurance is to aid those who are temporarily unemployed and need financial support. If spouses have experienced involuntary job loss before, respondents may have a greater incentive to participate in social insurance. For single respondents, their spousal instruments are set to 0.

To test the validity of the instruments, Table 3-2 presents the OLS regression on wage with respect to instruments. If the coefficient of an instrument is statistically insignificant, this instrument may be identified as a valid instrument. It can be seen that coefficients of risk variables are statistically significant whilst the other two coefficients

[26] The mean value of this 11-scale risk attitude measurement is around 3. Therefore, risk attitude levels above 3 are treated as high risk attitude.

[27] This 11-scale risk variable can be categorised in different ways. Likelihood-ratio tests have been conducted to compare the model fitness of different coding. In general, fewer risk categories are preferred than more. For detailed likelihood-ratio tests results, see Table 3-11 in Appendix.

[28] Children in this variable can be either a household member or not. Therefore, this variable is generated from the number of children respondent have.

of instruments are not. However, evidence from previous literature can be used to argue that an individual's risk attitude may have an influence on bonuses. Therefore, risk variables should be selected as instruments. In addition, weak instrument tests are undertaken as well. Table 3-3 shows the F statistic for the joint significance of instruments when regressing endogenous benefit variables on exogenous and instrumental variables. Based on a rule of thumb provided by Staiger and Stock (1997), the instruments are weak if the F statistic is less than 10. However, instruments seem to be weak in the bonus equation. Pairwise correlations of each endogenous variable and instruments are reported in Table 3-4, Table 3-5 and Table 3-6 as another weak instrument test. It can be seen from these tables that the correlations are not low.

Table 3-2 OLS regression on wage and instruments

	Coef.	**Robust Std. Err.**
Personal		
Male	0.1743***	0.0130
Age	0.0373***	0.0043
Age squared	-0.0005***	0.0001
Primary school	-0.1196	0.0778
Junior high school	-0.0355	0.0750
Senior high school	-0.0162	0.0752
Higher education	0.2463***	0.0774
Employment		
Job tenure	0.0101***	0.0011
Service workers	-0.1929***	0.0181
Agricultural and manufacturing workers	-0.1696***	0.0217
Other occupations	-0.2481***	0.0440
Public sector	-0.0279*	0.0158
Firm size between 6 and 50	0.0457*	0.0266
Firm size more than 51	0.0809***	0.0274
Instruments		
Low risk	0.0465**	0.0193
High risk	0.0712***	0.0182
No more than one child	-0.0330	0.0237
Spouse involuntary job loss	-0.0349	0.0236
_cons	6.4889***	0.1101
Obs	5,864	

***1% ** 5% * 10%

Dependent variable: natural logarithm of monthly wage

Table 3-3 F statistic of the instruments

	Bonus	Housing	Insurance
F Statistic	5.87	10.48	19.93
Prob>F	0.0001	0.0000	0.0000

Table 3-4 Pairwise correlation of instruments in bonus equation

	Bonus	Low risk	High risk	Child	Involuntary
Bonus	1				
Low risk	0.0018	1			
High risk	0.0346	-0.6683	1		
Child	0.1052	-0.0126	0.0853	1	
Involuntary	-0.0183	0.0411	-0.1004	0.0043	1

Bonus-natural logarithm of monthly bonus

Child-no more than one child Involuntary-spouse involuntary job loss

Table 3-5 Pairwise correlation of instruments in housing equation

	Housing	Low risk	High risk	Child	Involuntary
Housing	1				
Low risk	-0.0454	1			
High risk	0.1221	-0.6683	1		
Child	-0.0362	-0.0126	0.0853	1	
Involuntary	-0.1315	0.0411	-0.1004	0.0043	1

Housing-natural logarithm of monthly housing subsidies

Child-no more than one child Involuntary-spouse involuntary job loss

Table 3-6 Pairwise correlation of instruments in insurance equation

	Insurance	Low risk	High risk	Child	Involuntary
Insurance	1				
Low risk	0.0455	1			
High risk	-0.1119	-0.6683	1		
Child	0.1313	-0.0126	0.0853	1	
Involuntary	0.0900	0.0411	-0.1004	0.0043	1

Insurance-number of insurance

Child-no more than one child Involuntary-spouse involuntary job loss

In summary, risk attitude, one child and spouse involuntary job loss are selected as instruments. Therefore, equation 3-1 is overidentified as there are three endogenous variables and four instruments[29].

[29] Other instruments have considered and tested are being a smoker and years of smoking, both of which represent respondent's risk attitude. Also, whether spouse receive housing benefit, dummies for spouse's number of insurances are considered as well.

3.4 Results and Discussion

3.4.1 Descriptive statistics

There are 5,864 observations in the sample, of which urban respondents account for 46.69% while migrant respondents account for 53.31%. Table 3-7 presents the descriptive statistics for the overall sample as well as for two sub-samples. For the dependent variables of the four equations without taking the natural logarithm, the average monthly wage for the overall sample is 1623.82 yuan. The average monthly bonus and monthly housing subsidies are 316.58 yuan and 58.34 yuan respectively. Meanwhile, the average number of insurances in the overall sample is 1.54 with a maximum at 4. Compared with the migrant respondents, urban respondents have a higher average monthly wage (1940.1 yuan) and monthly bonus (499.91 yuan) as well as a higher number of social insurances (2.48). By contrast, migrant respondents have higher average monthly housing subsidies (101.36 yuan) than urban respondents (9.22 yuan).

For the personal characteristics in Table 3-7, male respondents account for 51.65% of the overall sample. The average age of respondents is 34.08 in the overall sample, with the minimum age of 16 and the maximum of 60. However, the average age is 41.49 for the urban sample while it is 27.59 for the migrant sample. In terms of the highest education level, 44.34% of the urban respondents have completed higher education while 48.11% of the migrant respondents have completed junior high school education, which are the highest proportions among all education categories in the two subsamples.

In terms of the employment characteristics in Table 3-7, the average job tenure for the overall sample is 7.82 years. However, the average job tenure for the migrant sample is only 2.92 years. For occupations, 57.71% of the urban respondents are in management position while 63.76% of the migrant respondents are service workers. In addition, only 39.7% of the respondents are employed in the public sector. In particular, 67.02% and 15.77% of respondents are employed in the public sector for the urban and migrant samples respectively, which suggests that migrant workers are mostly absorbed by the non-public sector. Finally, firms with more than 50 employees are common

Table 3-7 Descriptive statistics

Variables	Overall			Urban			Migrant		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Benefits									
Monthly wage	1623.82	1	30000	1940.1	1	30000	1346.81	100	8000
Natural logarithm of monthly wage	7.24			7.37			7.12		
Monthly bonus	316.58	0	17000	499.91	0	17000	156.00	0	8000
Natural logarithm of monthly bonus	2.62			3.27			2.06		
Monthly housing subsidies	58.34	0	3000	9.22	0	3000	101.36	0	2500
Natural logarithm of monthly housing subsidies	1.34			0.16			2.38		
Number of social insurances	1.54	0	4	2.48	0	4	0.7236	0	4
Personal									
Male	0.5165	0	1	0.4072	0	1	0.6123	0	1
Age	34.08	16	60	41.49	23	60	27.59	16	60
Never been to school (ref.)	0.0073	0	1	0.0029	0	1	0.0112	0	1
Primary school	0.0479	0	1	0.1899	0	1	0.0733	0	1
Junior high school	0.3336	0	1	0.1651	0	1	0.4811	0	1
Senior high school	0.3576	0	1	0.3696	0	1	0.3471	0	1
Higher education	0.2536	0	1	0.4434	0	1	0.0873	0	1
Employment									
Job tenure in year	7.82	1	43	13.41	1	43	2.92	1	34
Management position (ref.)	0.3320	0	1	0.5771	0	1	0.1174	0	1
Service workers	0.4425	0	1	0.2199	0	1	0.6376	0	1
Agricultural and manufacturing workers	0.1907	0	1	0.1362	0	1	0.2383	0	1
Other occupations	0.0348	0	1	0.0668	0	1	0.0067	0	1

Table 3-7 Descriptive statistics (continued)

Variables	Overall			Urban			Migrant		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Public sector	0.3970	0	1	0.6702	0	1	0.1577	0	1
Firm size no more than 5 (ref.)	0.0834	0	1	0.0504	0	1	0.1123	0	1
Firm size between 6 and 50	0.3578	0	1	0.3371	0	1	0.3759	0	1
Firm size more than 51	0.5588	0	1	0.6125	0	1	0.5118	0	1
Instruments									
Never take risk (ref.)	0.1876	0	1	0.2714	0	1	0.1142	0	1
Low risk attitude	0.2896	0	1	0.3342	0	1	0.2505	0	1
High risk attitude	0.5229	0	1	0.3944	0	1	0.6353	0	1
No more than one child	0.9142	0	1	0.9518	0	1	0.8813	0	1
Spouse experienced involuntary job loss	0.0813	0	1	0.1556	0	1	0.0163	0	1
Obs.	5,864			2,738			3,126		

among three samples, at 55.88%, 61.25% and 51.18% respectively for the overall, urban and migrant samples.

The descriptive statistics of instruments in Table 3-7 shows that 18.76% of the respondents from the overall sample never take risk while 52.29% of the respondents are in the high risk attitude group. In addition, 91.42% of the respondents reported that they have no more than one child. In particular, 95.18% of the urban respondents have one or zero children while 88.13% of the migrant respondents have no more than one child[30]. 8.13% of the total respondents' spouses have experienced involuntary job loss.

In addition to the descriptive statistics, Figures 3-3 and 3-4 show the average value of wages and benefits of the overall sample by firm size. In general, higher wages and more benefits are paid to employees in larger firms except for the housing benefit. Furthermore, when comparing the mean values of benefit variables between urban and migrant sub-samples (Figures 3-5 and 3-6), it can be seen that the finding from the overall sample can be also applied to the migrant subsample. However, it can be seen from Figure 3-5 that the average monthly housing subsidies for the urban sub-sample is much lower compared with the counterpart firm size categories in the migrant sub-sample, which suggests that housing subsidies are not a common benefit among urban employees. Generally, these figures support Oi and Idson's (1999) finding that larger firms tend to pay higher wages and offer more benefits than smaller firms.

3.4.2 Empirical results and discussion

OLS results of the wage equation (equation 3-1) for the full sample are presented in Table 3-8. To be specific, being male means 18.28% higher monthly wages than being female when holding all other variables constant. The monthly wages are 23.44%

[30] In fact, the average number of children parental respondents have is 1.16 (3,635 observations), which is generally consistent with the one-child policy in China. In addition, the average number of children migrant parental respondents have is 1.41 (1,046 observations) in comparison with 1.05 of that for the urban parental respondents (2,589 observations). In addition, this chapter also further calculates the average number of children in the parental households. To be specific, the average is 0.7 (3,635 observations). The average number of children in the migrant parental households is 0.48 (1,046 observations) while it is 0.79 (2,589 observations) for the urban parental households. The significant difference between the average number of children migrant parental respondents have and the average number of children in the migrant parental households (1.41 and 0.48) suggests that children of migrant workers may be left-behind in rural hometowns.

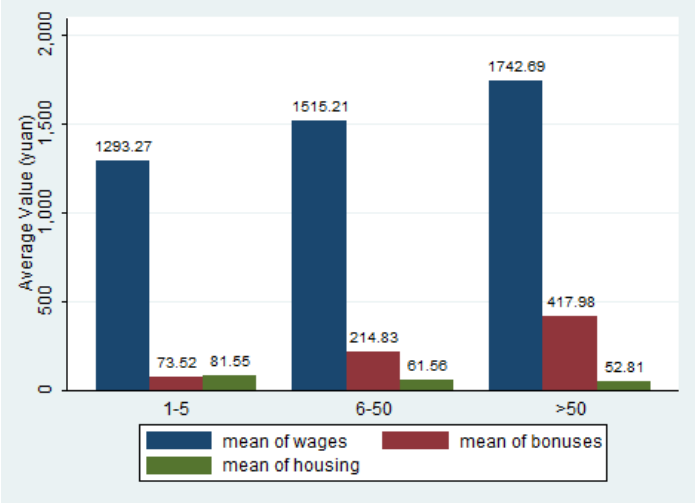

Figure 3-3 Means of benefit values by firm size

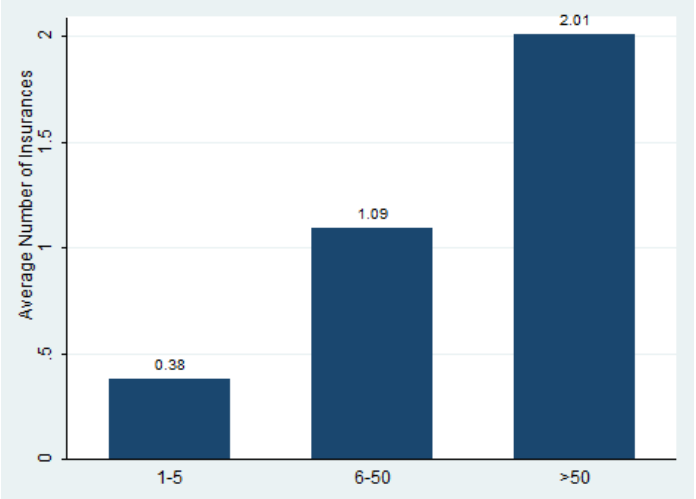

Figure 3-4 Means of number insurance by firm size

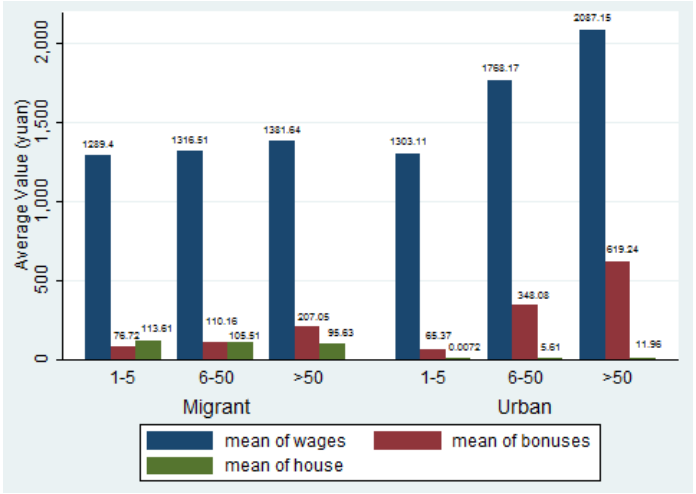

Figure 3-5 Means of benefit values by firm size over samples

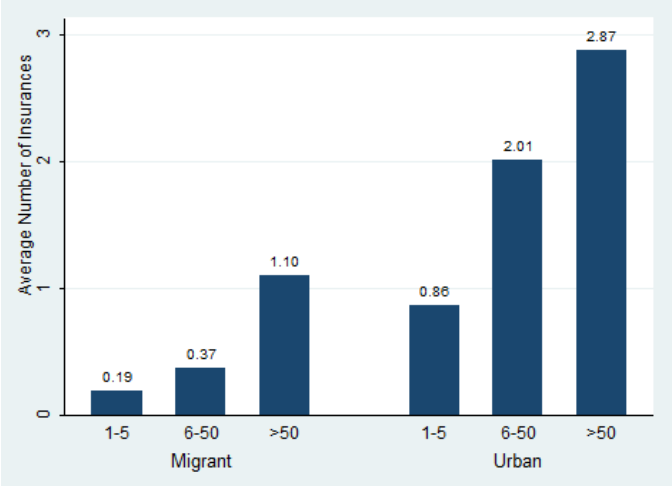

Figure 3- 6 Mean number of insurances by firm size over samples

Table 3-8 OLS results of the wage equation

	Coef.	Std. Err.
Personal		
Male	0.1828***	0.013
Age	0.0353***	0.0042
Age squared	-0.0005***	0.0001
Primary school	-0.1294*	0.0785
Junior high school	-0.0519	0.0744
Senior high school	-0.0025	0.0746
Higher education	0.2344***	0.0761
Employment		
Job tenure	0.0099***	0.001
Service workers	-0.1925***	0.0181
Agricultural and manufacturing workers	-0.1765***	0.0209
Other occupations	-0.2555***	0.0361
Public sector	-0.0372**	0.0158
Firm size between 6 and 50	0.0471*	0.0244
Firm size more than 51	0.0830***	0.0248
Benefits		
Natural logarithm of monthly bonus	-0.0094***	0.0022
Natural logarithm of monthly housing subsidies	-0.0003	0.0031
Number of social insurances	0.0128**	0.0051
_cons	6.5802***	0.1827
Obs	5,864	

***1% ** 5% * 10%

Dependent variable: natural logarithm of monthly wage

higher for those who attended higher education than those who have never been to school. Meanwhile, the monthly wages are 3.72% lower if employed in the public sector.

Compared with firm size of less than 5, the monthly wages are 8.3% higher if employed in a firm with more than 51 employees. The key hypothesis made for this equation is the trade-off among benefits and wages. Although the trade-off can be found in bonus and housing subsidies variables, the coefficient for the housing subsidies variable is statistically insignificant at 10% level. Therefore, there is only a trade-off between bonuses and wages. To be specific, if the monthly bonus increases by 1%, the wages will be reduced by approximately 0.94% when holding all other variables constant. By contrast, a trade-off cannot be found between social insurances and wages. If an additional insurance is provided to a respondent, the wage will increase by approximately 1.28% when other variables are constant.

As the OLS may bias the estimation results due to the endogenous benefit variables, the CMP estimation is applied to correct for the endogenous variable bias and estimate the wage equation in addition to three benefit equations simultaneously. Results from the CMP are presented in Table 3-9 and Table 3-10, in which Table 3-9 presents the results when four equations are estimated simultaneously while Table 3-10 presents the average marginal effect of the ordered probit model. The first column of Table 3-9 shows the results from the wage equation. It can be seen that the compensating wage differentials hypothesis cannot be justified as the coefficients of both bonus and housing variables are positive. Meanwhile, the coefficient for the insurance variable is not statistically significant at 10% level. When holding all other variables constant, if the value of the monthly bonus increases by 1%, 11.88% more wages will be paid to respondents. Similarly, if the value of monthly housing subsidies increases by 1%, the monthly wage will increase by 12.33%. For other coefficients in this equation, when holding all other variables constant, the wages for male respondents are approximately 7.58% higher compared with that for females. An additional year of job tenure increases the wage by 0.63%. Compared with management position, those who are employed as service workers, manufacturing workers and others have 15.09%, 10.67% and 13.69% lower wages respectively. However, firm size does not seem to be a determining factor for wages in the first column of Table 3-9.

In terms of the discussion for a specific benefit in the wage equation, bonuses can

Table 3-9 CMP results

	Wage		Bonus		Housing		Insurances	
	Coef.	**Std. Err.**	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**
Personal								
Male	0.0758**	0.0372	0.2557***	0.0766	0.5556***	0.0537	0.0491	0.0326
Age	0.0587***	0.0124	0.0607**	0.0246	-0.2429***	0.0173	0.1623***	0.0111
Age squared	-0.0007***	0.0001	-0.0012***	0.0003	0.0026***	0.0002	-0.0020***	0.0002
Primary school	-0.0742	0.1083	-0.0633	0.4661	-0.3194	0.3269	0.2576	0.2545
Junior high school	0.0117	0.1049	0.0302	0.4425	-0.4498	0.3103	0.6203**	0.2429
Senior high school	0.0396	0.1136	0.5431	0.4439	-0.7876**	0.3113	1.0858***	0.2429
Higher education	0.2395*	0.1286	1.0868**	0.4522	-1.0894***	0.3171	1.2817***	0.2452
Employment								
Job tenure in year	0.0063**	0.0026	0.0460***	0.0058	-0.0179***	0.0041	0.0307***	0.0024
Service workers	-0.1509***	0.0370	-0.5692***	0.1071	0.2310***	0.0751	-0.2350***	0.0441
Agricultural and manufacturing workers	-0.1067**	0.0477	-0.7980***	0.1236	0.2562***	0.0867	0.1506***	0.0511
Other occupations	-0.1369**	0.0622	-0.6934***	0.2141	-0.2189	0.1502	-0.1313	0.0870
Public sector	-0.0526*	0.0284	0.3634***	0.0931	-0.1919***	0.0653	0.3868***	0.0374
Firm size between 6 and 50	-0.0235	0.0422	0.5518***	0.1443	0.0048	0.1012	0.5017***	0.0757
Firm size more than 51	-0.0868	0.0690	1.2268***	0.1445	0.1209	0.1014	0.9732***	0.0749
Benefits								
Natural logarithm of monthly bonus	0.1188**	0.0473						
Natural logarithm of monthly housing subsidies	0.1233**	0.0485						
Number of social insurances	0.0093	0.0146						

Table 3-9 CMP results (continued)

	Wage		Bonus		Housing		Insurances	
	Coef.	**Std. Err.**	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**	**Coef.**	**Std. Err.**
Instruments								
Low risk attitude			0.3480***	0.1016	0.0514	0.0747	-0.0277	0.0459
High risk attitude			0.4790***	0.1007	0.0640	0.0740	-0.1073**	0.0438
No more than one child			0.2907**	0.1395	-0.5320***	0.0985	0.4471***	0.0633
Spouse experienced involuntary job loss			-0.0097	0.1248	-0.3414***	0.0954	0.1466**	0.0577
_cons	5.6442***	0.3569	-0.1096	0.6483	7.1869***	0.4552		
cut_1							5.1255***	0.3304
cut_2							5.4843***	0.3312
cut_3							5.8356***	0.3319
cut_4							6.4353***	0.3328
Obs.					5,864			

***1% **5% *10%

be regarded as performance pay in the compensating package, which may fluctuate with an individual's performance and the firm's profitability. A positive relationship between bonuses and wages is also found in Ewing (1996). He concludes that there is a 4% wage premium in the US if the performance pay is based on bonus. In fact, the roles of performance and incentive pay of bonus seem to be lost in some sectors in China. Bonuses may not be paid based on performance but on a given grade which depends on responsibility roles in an organisation (Cooke, 2004). Therefore, the positive relationship between bonuses and wages in the first column of Table 3-9 may imply that the payment of bonuses is not for compensating purposes in China, but may be associated with wages and position. Meanwhile, more profitable firms may offer both higher wages and generous benefits. This rent-sharing may apply to both bonus and housing subsidies, indicating a positive relationship between wages and benefits.

In addition, the trade-off between wages and insurance is also not found. Although previous empirical research on the compensating wage differentials hypothesis can justify the trade-off between wages and a single insurance (Montgomery et al., 1992; Olson, 2002), these results should be interpreted cautiously as a single benefit may correlate with other benefits which are not considered in the analysis (Miller, 2004; Llius and Abraham, 2013). Meanwhile, using the 2002 and 2003 Chinese firm level data, Nielsen and Smyth (2008) find that Chinese employers are less likely to transfer the costs of social insurances to employees in the form of low wages, which implies that wages are less likely to be reduced if insurance is provided to employees. A positive relationship between insurances and wages is also found by Frijters' et al. (2010). Their explanation for this positive relationship is that Chinese employers are required to financially contribute some percentage of total wages to social insurance. For example, employers in the public sector are required to contribute 20% of their total wages to pension[31]. Therefore, employers' insurance contributions are positively related to wages, suggesting a positive relationship between insurances and wages.

The other three columns of Table 3-9 give the estimation results using each

[31] Source: Ministry of Human Resources and Social Security of China. Retrieved on 20 September 2015 from http://www.mohrss.gov.cn/yanglaobxs/YLBXSzhengcewenjian/201505/t20150528_162022.htm

endogenous benefit variable as the dependent variable. The second column of Table 3-9 gives the estimation results for the bonus equation. To be specific, for the instrumental variables, when holding all other variables constant, if respondents have a low risk attitude, the average monthly bonus will rise by 34.8% compared with those who never take risks. Similarly, the average monthly bonus will rise by 47.9% if respondents have a high risk attitude compared with those who never take risks. Therefore, it can be clearly found that higher risk attitude is associated with a higher bonus payment. This is consistent with the literature which indicates that people who prefer to take risks are more likely to be selected to jobs with flexible pay and higher performance pay (Bonin et al., 2007; Grund and Sliwka, 2010; Cornelissen et al., 2011).

For other exogenous variables in the bonus equation, male respondents have 25.57% higher bonuses compared with females. Respondents with higher education have 108.68% higher bonuses than respondents who have never been to school. In terms of employment characteristics variables, an additional year of job tenure increases bonuses by 4.6%. Compared with respondents in management positions, bonuses are 56.92%, 79.8% and 69.34% lower for service workers, agriculture and manufacture workers as well as other occupations respectively. Public sector employees have 36.34% higher bonuses. Finally, 55.18% and 122.68% higher bonuses are paid to employees in firms employing 6 to 50 and more than 50 employees respectively in comparison to firms with less than 5 employees.

The third column of Table 3-9 presents the results from the housing equation. Two dummy instruments, namely no more than one child and spouse involuntary job loss, show negative relationship to housing subsidies. Male respondents have 55.56% higher housing subsidies than females. However, other exogenous variables present inconsistent results with column 2.

The fourth column of Table 3-9 shows the estimation results from the ordered probit insurance equation. Most of the coefficients are statistically significant and have the expected signs. In particular, for instrumental variables, the latent number of insurances variable increases if respondents have no more than one child and spouses have experienced involuntary job loss. In addition, the probabilities of getting an

Table 3-10 Average marginal effect of the insurance equation

	1		2		3		4		5	
	Zero Insurance		One Insurance		Two Insurances		Three Insurances		Four Insurances	
	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.
Personal										
Male	-0.0136	0.0090	0.0002	0.0001	0.0009	0.0006	0.0026	0.0018	0.0098	0.0065
Age	-0.0072***	0.0006	0.0014***	0.0001	0.0016***	0.0001	0.0025***	0.0002	0.0016***	0.0004
Primary school	-0.0713	0.0704	0.0011	0.0011	0.0046	0.0046	0.0139	0.0137	0.0517	0.0510
Junior high school	-0.1716**	0.0671	0.0027**	0.0012	0.0112**	0.0044	0.0334**	0.0131	0.1244**	0.0488
Senior high school	-0.3004***	0.0669	0.0047***	0.0014	0.0195***	0.0044	0.0584***	0.0131	0.2177***	0.0488
Higher education	-0.3546***	0.0675	0.0055***	0.0016	0.0231***	0.0045	0.0689***	0.0133	0.2570***	0.0493
Employment										
Job tenure in year	-0.0085***	0.0007	0.0001***	0.00003	0.0006***	0.0001	0.0017***	0.0001	0.0062***	0.0005
Service workers	0.0650***	0.0121	-0.0010***	0.0003	-0.0042***	0.0008	-0.0126***	0.0024	-0.0471***	0.0089
Agricultural and manufacturing workers	-0.0417***	0.0141	0.0007**	0.0003	0.0027***	0.0009	0.0081***	0.0028	0.0302***	0.0103
Other occupations	0.0363	0.0241	-0.0006	0.0004	-0.0024	0.0016	-0.0071	0.0047	-0.0263	0.0174
Public sector	-0.1070***	0.0102	0.0017***	0.0004	0.0070***	0.0008	0.0208***	0.0021	0.0776***	0.0074
Firm size between 6 and 50	-0.1388***	0.0207	0.0022***	0.0005	0.0090***	0.0014	0.0270***	0.0041	0.1006***	0.0153
Firm size more than 51	-0.2692***	0.0199	0.0042***	0.0009	0.0175***	0.0015	0.0524***	0.0042	0.1952***	0.0152

Table 3-10 Average marginal effect of the insurance equation (continued)

	1		2		3		4		5	
	Zero Insurance		One Insurance		Two Insurances		Three Insurances		Four Insurances	
	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.	dy/dx	Std. Err.
Instrument										
Low risk attitude	0.0076	0.0127	-0.0001	0.0002	-0.0005	0.0008	-0.0015	0.0025	-0.0055	0.0092
High risk attitude	0.0297**	0.0121	-0.0005**	0.0002	-0.0019**	0.0008	-0.0058**	0.0024	-0.0215**	0.0088
No more than one child	-0.1237***	0.0174	0.0019***	0.0005	0.0080***	0.0012	0.0240***	0.0035	0.0896***	0.0127
Spouse experienced involuntary job loss	-0.0406**	0.0159	0.0006**	0.0003	0.0026**	0.0011	0.0079**	0.0031	0.0294**	0.0116
Obs.	5,864									

*** 1% ** 5% * 10%

additional insurance increase with educational level, employed in the public sector and firm size.

The average marginal effect of the insurance equation is presented in Table 3-10. The marginal effects present consistent signs from outcome 1 to 4 (column 2 to 5). For example, the instrumental variables in column 5 show that having no more than one child leads to a 8.96 percentage points higher probability of having four insurances, which suggests that children are a significant determinant of parental adults' participation in a social insurance programme. This is not only due to the fact that in the Chinese culture it is children's responsibility to take care of the elderly parents, but also a result of the impact of the one-child policy in China. Therefore, social insurance seems to be a reliable source of financial income when experiencing unexpected events in life rather than solely relying on children. Meanwhile, if spouses experienced involuntary job loss, the probability of having four insurances is 2.94 percentage points higher. Spouses' involuntary job loss experience can influence respondents' insurances participation, which suggests that respondents want to take precautions against unexpected events within households.

For the marginal effect of other exogenous variables in column 5, the probability of having four insurances is 0.16 percentage points higher with an additional year of age. The probabilities of having four insurances are 21.77 percentage points and 25.7 percentage points higher if respondents have attended senior high school and higher education respectively compared with those who have never been to school. In addition, the probability of having four insurances is 0.62 percentage points higher with an additional year of job tenure. Compared with occupation in management positions, the probabilities of having four insurances are 4.71 percentage points lower and 3.02 percentage points higher if occupations are service workers and manufacturing workers respectively. The probability of having four insurances is 7.76 percentage points higher if employed in the public sector. Finally, the probabilities of having four insurances are 10.06 percentage points and 19.52 percentage points higher if the firm sizes are between 5 and 50 and more than 50 respectively compared with firm employing less than 5 people.

3.5 Conclusions

The fact that employment benefits are associated with wage payments has not changed since the wage reforms in China. Employing data from the 2009 RUMiC, this chapter empirically examines whether benefits are paid to compensate for wages. To be specific, this chapter examines the compensating wage differentials hypothesis in China.

A package of benefits which includes bonuses, housing subsidies and social insurances is selected to examine the substitution effect between wages and benefits for both urban and migrant workers. According to the literature, the results of the trade-off between wages and benefits may be biased if the endogeneity problem of benefit variables in the wage equation is neglected. To correct for the endogenous problem of benefit variables, instrumental variables which determine benefits but not wages are selected. The CMP method is used to estimate the simultaneous models as it is able to accommodate different types of the dependent variables in the four equations.

However, the CMP results on the wage equation show that the compensating wage differentials hypothesis cannot be justified with the Chinese data. To be specific, the bonus and housing variables are positively related to the wages, which does not support the compensating role of benefits. Also, the coefficient of the insurance variable is statistically insignificant in the wage equation. These results show that, on the one hand, bonus payment and housing subsidies may reflect rent-sharing in China, which implies that profitable firms are more likely to pay higher benefits. On the other hand, Chinese employers are less likely to transfer the costs of insurance to wages but pay insurance proportionately to wages as a compulsory part. Therefore, according to Amuedo-Dorantes and Mach (2003), the positive coefficients of benefit variables may suggest that Chinese employers pay additional benefits to encourage and motivate employees.

A crucial part of this chapter is to find instrumental variables for three endogenous benefits variables. It can be seen that a higher risk attitude is associated with higher bonuses. In addition, both the number of children respondents has and spouse's involuntary job loss experiences have an influence on housing and insurance variables.

Some data problems may have contributed to the failure to examine the compensating wage differentials hypothesis in this chapter. According to Smith and Ehrenberg (1982), data on the actual costs of employer provided benefits should be available when examining the hypothesis. In terms of this chapter, the value of housing subsidies are partly based on respondents' own estimations, which are not the exact employers' costs. Meanwhile, as the actual costs of an employer's contribution to insurance are unavailable from the dataset, the ordered number of the insurance variable has to be used in the estimation. Therefore, the actual costs of some of the employer provided benefits are absent from the dataset used in this chapter, which may not enable the compensating wage differentials hypothesis to be properly examined. In addition, the relationship between wages and benefits should be clearly identified in the estimation. However, an employer's insurance contribution is proportionate to wages in China, which may have a function between wages and insurance contribution and hence bias the trade-off between insurances and wages.

However, the compensating wage differentials theory itself may not stand in the Chinese context. The assumptions of utility maximisation and perfect mobility for the theory may be too strong (Brown, 1980). For instance, even when workers are aware of better employment benefits in other firms, barriers such as the household registration may impede job turnover in China. Therefore, for future empirical research on compensating wage differentials in China, it is better to use panel data analysis to capture the time-varying characteristics of both employers and employees' information in order to correct for the omitted variable bias (Elliott and Sandy, 1998).

3.6 Appendix

Table 3-11 Likelihood-ratio tests on 11-scale risk variable categories

LR1: 0, 1-5, 6-10

LR2: 0, 1-3, 4-10

LR3: 0, 1-3, 4-6, 7-10

LR4: 0, 1-2, 3-4, 5-6, 7-10

LR5: 0, 1, 2, 3, 4, 5, 6, 7-10

LR6: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

LR Chi2 Prob>chi2	**LR1**	**LR2**	**LR3**	**LR4**	**LR5**
LR3	-0.61	0.06			
	1.0000	0.8012			
LR4	1.27	1.94	1.88		
	0.5299	0.3784	0.1703		
LR5	3.36	4.03	3.97	2.09	
	0.6452	0.5451	0.4105	0.5546	
LR6	7.33	8.01	7.94	6.06	3.98
	0.5010	0.4327	0.3375	0.4160	0.2638

Chapter Four

Return to Hometown or Stay in City: A Survival Analysis on Return Migration in China

4.1 Introduction

Large scale rural-urban migration did not begin in China until the mid-1980s. Before that, due to the household registration system, rural people were not allowed to move into cities to live and work. The main motivation for this internal migration in China is the income difference between rural and urban areas, and amongst the regions (Shen, 2002; Zhao, 2005; Lee and Meng, 2010). For example, rural people in the western and central parts of China may prefer to migrate to the eastern or coastal provinces where incomes are higher. Table 4-1 illustrates the number of migrant workers in China from 2009 to 2014, which shows how the migrant population is increasing. The statistics also show the number of local migrants and non-local migrants, where local migrants refer to migrant workers who work in their registration city or town while non-local migrants work outside their registration place.

Table 4-1 Number of migrant workers by year

	2009	2010	2011	2012	2013	2014
Total	229.78	242.23	252.78	262.61	268.94	273.95
Local migrants	84.45	88.88	94.15	99.25	102.84	105.74
Non-local migrants	145.33	153.35	158.63	163.36	166.1	168.21

Source: National Bureau of Statistics of China (in million)

Note: local migrants refer to migrant workers who work in their registration city or town while non-local migrants work outside their registration places.

Return migration became a new trend in China from around 2000 (Meng, 2012), which means migration from urban areas such as large cities to rural areas. Although official statistics on the scale of return migrants are not yet available, research on return migration has attracted attention from both academic and policy sides. Therefore, the objective of this chapter is to examine and identify those factors which motivate return migration in China. In contrast to previous Chinese studies which tend to emphasise

either the household registration system or the macroeconomic environment as motivations for return migration, this chapter examines the relationships between hourly wage, household savings, social networks and return migration. In addition, heterogeneity between the new and old generation of migrants is considered.

Previous studies found that the household registration system is an important factor which motivates return migration in China. Migrant workers in cities do not share the same opportunities as their urban counterparts. For example, they may be discriminated against in some job opportunities due to their rural registration status (Meng and Zhang, 2001). Additionally, they have disadvantages in human capital and education and so migrant workers in cities are commonly employed as cheap labour. Meanwhile, migrant workers are excluded from most social insurance schemes. Not only because of their low awareness of participating in social insurance, but also due to a lack of specific guidelines on migrant workers' social insurance participation which makes insurance funding difficult to transfer after they return to rural areas (Giles et al., 2013).

In addition, most of the migrant workers migrate to cities without their children and spouses. These left-behind children have been found to suffer from health and emotional problems, undertaking long hours of farm and household work in their rural homes, as well as tending to show poor educational performance (Ye and Pan, 2011; Murphy et al., 2015). Even for those migrant workers taking their children to the cities, schools in cities are unable to accept migrant children when they reach school age due to the children's rural registration status (Wang and Fan, 2006). However, housing should be a priority area if migrant workers want to stay in cities permanently. They cannot afford high housing costs in cities. Moreover, housing schemes which offer cheap or economy housing to low income people in cities are not open to rural registered people (Li and Zhang, 2011). Therefore, cheaply shared dormitories provided by employers are common amongst migrant workers in cities (Akgüç, 2014). Under such living conditions, migrant workers typically either leave their spouses in rural hometowns or live separately with spouses in the migration cities. However, being separated from spouses may lead to an unstable marriage, which is costly for the personal development of migrant workers (Zhao, 1999).

The above facts suggest that the rural registration status of the migrant workers is a key factor which contributes to temporary migration in China. Migrant workers' return decisions involve personal as well as household factors such as those associated with institutional barriers. Therefore, analysis of the return decision can be made from the migrant workers' own labour supply side.

However, the return decision can also be analysed from the labour demand side. Economic development is increasingly moving to the central and western parts rather than clustering in coastal regions such as the Yangtze River Delta, Pearl River Delta and Beijing-Tianjin-Hebei Region (Liang et al., 2014). For example, the Western Development Project starting in 2000 aimed to stimulate economic development in Western China and narrow the income disparity between the West and the East. A similar plan, the "Raising of Central China", was proposed in 2006 to stimulate the economic development of the central area. Capital, which was invested in the coastal regions, is now transferring to inland China. Local employment opportunities attract rural people who may otherwise migrate to the coastal provinces to return to their own provinces. Therefore, return migration has occurred due to the demand for labour in inland China (Zhan and Huang, 2013). The phenomenon of migrant shortage since the early 2000s can be seen as evidence of the impact of these policies.

Meanwhile, the 2008 global financial crisis may have impacted on return migration as well. The export-oriented economy in China was affected significantly by the low demand globally. Some labour-intensive factories in the coastal cities were closed, making migrant workers unemployed and prompting a return to hometowns (Xu, 2010). During that time, governments in some coastal cities promoted a policy of transferring labour-intensive industries into capital-intensive ones, which required less migrant workers and thus may have been a factor in return migration (Liang et al., 2014).

Overall, based on the evidence from both the institutional and macroeconomic environments, it can be argued that return migration in China is not only a decision made from the individual and household perspective, but has also been influenced by policy and economic environment changes.

In addition, having noticed that both the age structure of the migrant population

and the purposes of migration are changing in China, the 2010 No.1 Central Government Document defined migrant workers who were born after 1980 as new generation migrants. These migrants are generally considered to be better educated, more likely to undertake manufacturing work, preferring to migrate to the eastern provinces or large cities, as well as consuming migration savings in migration destinations (National Bureau of Statistics of China, 2014). There were 84.87 million new generation migrants in 2009, which accounts for 58.4% of the non-local migrant workers (National Bureau of Statistics of China, 2011). In terms of their return migration preference, almost half of the new generation migrants have the intention to be permanent migrants in cities. As most of the new generation migrants have no experience of undertaking farm work, they are less likely to return to the rural areas for farming even though there are unfavourable employment situations in cities for them.

This chapter contributes to the return migration literature in three ways. Firstly, it uses a nationwide Chinese dataset to provide general and representative findings on return migration. Data from the Chinese part of the 2009 Rural-Urban Migration in China (RUMiC) is employed in this chapter, in which the rural sub-survey covers around 8,000 rural households in 9 migration origin provinces[32] while the migrant sub-survey covers 5,000 migrant households in 15 migration destination cities[33]. Typically, previous return migration studies in China used data collected in one city. However, those findings may not be representative as the return decision may be influenced by the local economic and employment environment in the migration destination city or the origin place. In addition, the dataset used in this chapter could provide unbiased migration information as return migrants were interviewed in their rural hometowns while migrant workers were interviewed in the migration cities.

Secondly, the Cox survival analysis is used in this chapter, which is distinct from the methodologies employed in previous Chinese literature. Taking advantage of the durations recorded in the dataset, this econometric technique not only enables return

[32] These 9 provinces are Anhui, Chongqing, Guangdong, Hebei, Henan, Hubei, Jiangsu, Sichuan and Zhejiang.

[33] These 15 cities are Bengbu, Chengdu, Chongqing, Dongguan, Guizhou, Hangzhou, Hefei, Luoyang, Nanjing, Ningbo, Shanghai, Shenzhen, Wuhan, Wuxi and Zhengzhou.

migrants and migrant workers to be distinguished by the censoring status of the durations, but is also able to examine the magnitude of variables on the length of stay (Hare, 1999). The third contribution of this chapter is to incorporate heterogeneity between the new and old generation migrants into the return decision modeling, where the former are taken to be those born after 1980.

The organisation of this chapter is as follows. Hypotheses to be tested are made in the next section. Section 4.3 provides a literature review on return migration. Section 4.4 describes the data and methodology of this chapter while Section 4.5 presents the results and discussion. Conclusions are given in Section 4.6.

4.2 Conceptual Framework and Hypotheses

Neoclassical economics (NE) states that migration is a cost-benefit decision (Sjastaad, 1962; Todaro, 1969). Potential migrants compare the costs and benefits before migration. For example, they compare the wage differentials and unemployment rates between the origin and destination areas before deciding whether to migrate. However, return migration may occur if the expected lifetime earnings are not met or utility is not maximised in the migration destination. In addition, return may also occur if human capital can get a higher return in the migration origin than in the destination. Therefore, the NE emphasises permanent migration. Migrants may choose to migrate with family members. Return is due to *failure* or unrealised expectations in the destination area.

By contrast, the new economics of labour migration (NELM) views migration as temporary (Stark and Bloom, 1985; Massey et al., 1993). For example, once the earnings target is achieved in the migration destination, return migration would occur. Therefore, return is due to *success* or realised expectations in the destination area. In addition, migration is a household strategy rather than an individual's own decision according to this theory. For instance, spouses and children left behind can be a factor to motivate return migration. Although many theories are applied to international migration, it is equally relevant to internal migration such as in China (Stark and Bloom,

1985). In addition, two theories can be used simultaneously in a return migration study (Massey et al., 1993).

Empirical studies in the return migration literature tend to build models based on the NELM. Given the probability of return, migrants work harder to achieve their earning target than native workers (Galor and Stark, 1991). If wages are higher, it will enable migrants to take less time to achieve this earning target before return (Constant and Massey, 2002). Therefore, wages are negatively related to migration duration and can be used as a measurement of work effort. Meanwhile, given the probability of return migration, migrants save more than native workers (Galor and Stark, 1990; Islam et al., 2013). Remitting their savings to left behind family members, which thus diversifies and improves household income (Zhu, 2007; Kilic et al., 2009) as well as being for investment or self-employment purpose after return (Thomas, 2012). Hence, once the earnings or savings target is achieved in the destination, return migration occurs. In addition, the return migration decision can also be made as a result of the purchasing power parity between the host and home regions' currencies (Kirdar, 2009). Migrants believe that the purchasing power of the host region's currency is higher in their own region where prices are lower. They may choose to remit and consume their migration savings after their return to the home region (Constant and Massey, 2002). Therefore, savings are positively related to the probability of return. Overall, two hypotheses can be made based on the NELM and previous literature, which intend to be justified through the use of Chinese data in this chapter.

Hypothesis 1: according to the NELM, if migrants have higher hourly wage, they are more likely to return.

Hypothesis 2: according to the NELM, if migrants have a higher annual household savings, they are more likely to return.

Moreover, the network theory argues that the migrant social network is able to reduce the costs and risks behind the migration and hence increase the probability of migration (Massey et al., 1993). Therefore, a larger social network may extend the migration duration as well as increasing migrants' attachment to the destination. A hypothesis can be made in terms of the social network.

Hypothesis 3: according the network theory, if migrants know more people in the migration destination, they are less likely to return.

However, higher hourly wages and household savings seem to have a competing effect on return migration (Kirdar, 2009). Higher hourly wages and household savings are able to accelerate the return process based on the NELM. On the other hand, return is associated with an opportunity cost of staying in cities longer to get higher earnings and savings. Motivated by this finding and given the fact that the new generation migrants are more willing to stay in cities permanently than the old generation migrants (National Bureau of Statistics of China, 2011), it is sensible to assume that the new generation migrants prefer to stay in cities longer when there are higher hourly wages and savings there. Return migration is associated with an opportunity cost and hence they are reluctant to return. By contrast, the old generation migrants are believed to have lower expectations about staying in cities permanently. Their behaviour is more consistent with what the NELM states and they prefer to return when their earnings and savings targets are achieved. Therefore, when there are increases in wages and savings, the hazard of return would reduce for the new generation migrants whilst it would increase for the old generation migrants. The two generations respond differently to these changes. Hypotheses 1 and 2 can be extended and applied to examine heterogeneity across the two generations.

Hypothesis 4: when there is an increase in hourly wages, the hazard of return increases when changing generation from the new to old.

Hypothesis 5: when there is an increase in the annual household saving, the hazard of return increases when changing generation from the new to old.

In addition, as the social network is important for migration, knowing more people in cities seems to be more important for the new generation migrants given their willingness to stay in cities permanently. Therefore, the marginal effect of an additional friend should be higher for the new generation migrants than for their old counterparts.

Hypothesis 6: when there is an increase in the number of friends in cities, the hazard of return increases when changing generation from the new to old.

4.3 Literature Review

In this section, studies on international and internal return migration are introduced. Studies on modeling the return decision and return intention are also discussed in each subsection. In return decision studies, return migrants were directly interviewed and asked their return motivations, which means return migration has occurred. By contrast, in return intention studies, the expected migration duration or the likelihood of return in the future was asked to migrants. For example, the German Social-Economic Panel (GSOEP) survey asked immigrants whether they intended to stay in Germany permanently in each wave. If the answer was *no*, then it further asked the number of years they would like to stay before returning. Although respondents reporting return intention do not necessarily mean return migration has occurred or will occur, it can still identify factors which may have an impact on the future return decision.

4.3.1 International return migration studies

Return migration can be motivated by at preference for consuming in the origin country, differences in purchasing power parity (PPP) between countries and the high return of human capital in the origin country (Dustmann and Weiss, 2007). For example, savings of immigrants can be a factor determining their migration duration. Dustmann (1997) builds models on this issue and emphasises that migrants accumulate precautionary savings to avoid labour market risk and instabilities whilst abroad.

In empirical research, Kirdar (2009) argues that immigrants would return when they have accumulated savings in the host country and prefer to consume them in the lower price home country. Using data from the 1984-2000 GSOEP which interviewed immigrants from Greece, Italy, Spain, Turkey and former Yugoslavia to Germany, he applies the discrete-time survival analysis to examine the return motivations. The results show that the higher purchasing power of the host country's savings in the origin countries induce older immigrants to return as they are able to realise the value of the savings in the origin country. However, younger immigrants are reluctant to return even if there is a high purchasing power of their savings at home. For them, return increases the opportunity cost of accumulating more savings in the host country. In terms of the

effects of unemployment spells and retirement on the return decision, Kirdar (2009) finds that return is more likely to occur when the unemployment spell is less than three years and the retirement spell less than one year.

In addition, household and social factors may induce return migration as well. Constant and Massey (2002) firstly compare the NE and NELM approaches and then design empirical models based on these theories to examine whether household and social factors impact on the return decision. Discrete-time survival analysis with data from the 1984-1997 GSOEP is applied to estimate the return probabilities. The results suggest that immigrants that have weak employment and social attachments to Germany but strong attachments to the home country are more likely to return. However, wages and occupation do not have a significant impact on the likelihood of return. In addition, the discrete-time survival analysis shows that migrants who send money home behave consistently with the NELM and are more likely to return once the presence of the spouse is controlled for. Similar findings are seen in Constant and Massey (2003), where the discrete-time survival analysis is applied to the same dataset to compare the return probabilities among immigrants who intend to stay in Germany, return migrants and those who are uncertain about whether to stay or return.

Meanwhile, Azzarri and Carletto (2009) use data from the 2005 Albanian Living Standard Measurement Survey (ALSMS) to study the impact of household and social factors on return migration from Greece and Italy to Albania. They focus on respondents who have migration experience in the sample and use the censoring status of the migration duration at the time of the survey to distinguish migrants and return migrants. Their survival analysis results suggest that the return decision should take into account both the household members' age structure and social networks in the destination countries.

Employing the same dataset, Vadean and Piracha (2010) use the multinominal logit model to distinguish the socio-economic characteristics of non-migrants, permanent migrants, return migrants and circular migrants in Albania. The term, circular migrants, refers to those migrants who repeatedly move between the home country and one or more host countries. They find that gender, age, education and household ties

significantly have a significant impact on migration decisions. In addition, Vadean and Piracha (2010) examine the probability of returnees' re-migration after their first trip by using a probit model. The results suggest that circular migrants are more likely to be males, and more likely to originate from rural and less developed areas. The return decision is highly influenced by household reasons, failure in the destination country as well as whether the saving target has been achieved.

Saarela and Finnas (2013) argue that international migration and return migration should be a household decision rather than an individual one, and particularly in countries such as Sweden and Finland where gender equality is highly developed, the wives' education should be independent to the families' migration decision. Using registration data from Finland, Saarela and Finnas (2013) find that if the wife has vocational education, the emigration probability of the Swedish speaking population is lower than if the wife only has basic educational attainment. However, this probability is higher if the wife has higher education. In terms of return migration, controlling for the husband's education, both vocationally and higher educated wives have higher return probabilities than a basically educated wife. This study also finds that both a spouse's educational level can influence the return decision.

The above studies focus on the international return decision. However, studies on return intention can also be found in the literature. Dustmann (1999) hypothesises that the intended immigration duration would be longer if the return to the destination country's specific human capital is higher in the destination country than that in the origin country's labour market. Employing data from the 1984 GSOEP and using the destination country's language fluency as the specific human capital investment, he builds a probit language fluency model with respect to the intended immigration duration. When this duration variable is treated either exogenously or endogenously in the language equation[34], he finds that immigrants who are able to speak German well or very well would have a higher intention of staying in Germany.

Dustmann (2003a) also argues that there are two effects of the increasing economic

[34] The instrumental variable used to correct for the endogenous duration variable is whether parent lives in Germany.

disparity between origin and destination countries. On the one hand, immigrants would stay longer in the host country to benefit from high wages. On the other hand, the marginal utility of wealth may decrease if staying abroad for a long period which may induce return migration. Therefore, Dustmann (2003a) hypothesises that immigration duration may decrease if there is a rise in the wage differential between the origin and destination country. His argument is that immigrants shorten migration duration if they can achieve earning targets quickly. Using 14 years of panel data from the GSOEP (1985-1997), he examines the changes between the intended immigration duration and wages using least squares. The results suggest that the expected immigration duration is negatively associated with wage differentials, which is consistent with his hypothesis.

Pinger (2010) uses survey data from the Republic of Moldova to study the return intention of Moldovan migrants and their remittance behaviour. The probit return intention model suggests that both social (such as family ties and network) and economic (such as wage differentials) connections with the host and origin countries are motivations for the return migration. In addition, Pinger (2010) finds that emigrants who intend to return remit approximately 30% more of their savings home than those who intend to stay abroad permanently.

4.3.2 Internal return migration studies

Internal return migration studies mainly focus on African and Asian countries. For example, Falkingham et al. (2012) study the urban-rural migration of elderly people (over 50) living in the slum community in Nairobi (Kenya). Using destination-based panel data from the 2006-2009 Urbanisation Poverty and Health Dynamic Programme, Cox survival analysis is applied to estimate the duration of living in the slum, which is able to incorporate time-varying variables in the analysis. The findings show that the return intention declines with the duration time for living in the slum. In addition, older people who left their children in the rural areas are more likely to return while spousal separation does not induce return. However, Falkingham et al. (2012) acknowledge that the return migration in their study may not be permanent as circular migration may occur. Therefore, long panel data are expected to be used in order to consider the case of circular migration in future research.

Hirvonen and Lilleor (2015) use data from the Kagera Health and Development Survey to study return migration in Tanzania, which is a 19 year panel survey (1990s, 2004 and 2010). In this survey, respondents migrated either within the Kagera region or to other places in Tanzania and Uganda. A probit model is used to distinguish between return migrants and others (including migrants or non-migrants). They find that the return decision is mainly based on failure reasons, such as the lower educational level of respondents and lower levels of household consumption or asset holding. In addition, males who are financially supported by their families and females who have close attachments to family members and communities are more likely to return.

In addition, Piotrowski and Tong (2010) employ longitudinal data from the Nang Rong Project (1984, 1994 and 2000) to investigate the return migration from Bangkok to the Nang Rong region of Thailand. This longitudinal survey is origin based, asking migrants' family members to provide proxy information on migrants. Their probit return model established on the pooled sample shows that return can be attributed to failure in the destination area. For example, lower educated migrants are more likely to return. In terms of non-economic reasons, the presence of children and parents significantly motivate return.

Junge et al. (2015) compare internal return migration in Thailand and Vietnam and make a distinction between local return migrants and regional return migrants. The local return migrants refer to those who return to their home villages while the regional return migrants are those who return to other places within their provinces. Using panel household data collected in the two countries (2007, 2008 and 2010), a multinominal logit model is applied to estimate the return decision model which compares migrants, local return migrants and regional return migrants. They find that lower educated respondents tend to be local return migrants.

In the literature, return migration studies have been undertaken using Chinese data as well. Hare (1999) studies migration and return migration in China. Using rural household data collected in the Xiayi County (Henan province) in 1995, a probit migration decision model is built with respect to individual, household and community level variables. The results suggest that the migration decision is determined by the

demand side of the labour market such as years of schooling rather than household factors. When examining the return decision model, the number of migration days is estimated by a Weibull duration model. The Weibull duration model results show that the return decision is not due to failure in cities, but it is influenced by household factors such as undertaking farm work which "pull" migrants to return to their rural hometowns. However, Hare (1999) acknowledges that due to the small sample size (117 migrants), unobserved heterogeneity in the Weibull model is unable to be tested in the analysis.

Employing the 1999 rural household survey conducted in six Chinese provinces, Zhao (2002) examines the causes of return migration. He uses the logit model in his study, where both migrants and return migrants are in the sample. Zhao (2002) finds that the return decision is a combination of both pull and push factors. To be specific, a low return to education and human capital in cities push migrants to return to rural hometowns while spousal separation and non-farm employment opportunities in rural hometowns pull them to return.

Wang and Fan (2006) argue that adopting a success-failure framework may be inadequate for explaining return migration in China, in which successful migrants are those who contribute to their hometowns' economic development while failed migrants do not have the propensity to make such a contribution. Using data from the 1999 rural survey conducted in the Sichuan and Anhui provinces in China, they use multinominal logit model to compare the human capital and household characteristics among migrants, non-migrants and return migrants. The results suggest that the return decision made is not due to their success in cities or having potential contributions to their hometown development after return. When categorising return reasons by success, failure and family, Wang and Fan's (2006) descriptive statistics show that household reasons, such as marriage and caring for family members, motivate migrants to return. Therefore, they conclude that the success-failure framework may be inadequate for explaining the return migration in China and household reasons may motivate return migration to a greater extent.

Chunyu et al. (2013) employ the 1995 China 1% Population Sample Survey and 2000 China Population Census to study return migration in China. Individuals from the

Sichuan province migrating to other provinces, return migrants to Sichuan and non-migrants in Sichuan are identified from the surveys. Logit models are used to estimate the return propensities between migrants and return migrants. Chunyu et al. (2013) find that, on the one hand, the rate of return migration varies by province. In particular, the return rate from the Guangdong province to Sichuan is the highest. They argue that this return rate is strongly associated with the global economic downturn. On the other hand, older, married and better educated migrants are more likely to return. However, migrants who migrated at an older age are less likely to return.

In terms of the studies on return intention in China, Yue et al. (2010) interviewed migrant workers in Shenzhen in 2005 to investigate their return intentions. The potential choice for migrants is to stay in the city, or return for non-farm and farm jobs. They use birth years ranging from 1970 to 1980 to divide the sample into new and old generation migrants. Descriptive statistics on return intentions with respect to different generation definitions show that younger migrants are more willing to stay in cities and undertake non-farm jobs. In addition, when using 1975 to distinguish between the two generations of migrants and estimate the intentions of two generations separately, the multinominal logit models on these choices show that the new generation migrants have a strong intention to seek non-farm jobs upon return. Their explanation for this finding is that the new generation migrants regard migration as an investment in human and social capital. Therefore, their return motivation is due to the social and economic conditions at the origin rather than household responsibilities.

Zhu and Chen (2010) use migration data collected in the Fujian province in 2002 and 2006 to examine the return intentions of migrants. Migrant workers' settlement intentions in cities are modelled by a logit regression. They find that the settlement intentions of the migrant workers are not only influenced by their own household registration status and place of origin, but also related to household income and the housing condition in the destination.

Piotrowski and Tong (2013) use a migrant survey in the Guangdong province to study return intentions. The intention to stay ranges from within 1 year, 3 years, 5 years to never return. Their ordered probit model takes into account both economic and

non-economic factors on the return intention. They conclude that in terms of the economic factors, the return probability is high once the migrants' earning target is achieved. This suggests that migration is a household strategy and therefore the return intention is associated with the family's economic condition. By contrast, in terms of non-economic reasons, children left in the origin province accelerate the return process whilst migrants who have more than 30% of their peers from the same village and are living with friends decelerate the return process, which is arguably a network effect.

Cao et al. (2015) argue that self-employed migrants are less likely to return due to their economic and social attachment to cities as well as their initial investment in cities. They examine the causality between self-employment and settlement intention of migrant workers. Using a migrant survey data collected in 12 Chinese cities in 2009, they apply the two-stage least squares (2SLS) to correct for the endogeneity problem of self-employed variable. Self-employment experience before migration and household social class are selected as instruments. The results justify their hypothesis that being self-employed is more likely to mean the individual will settle in cities. In addition, Cao et al. (2015) also find that self-employed migrants are more likely to migrate with their spouse, live with family members, purchase houses in cities and be better integrated to city lives.

4.3.3 Activities after return

The literature in this sub-section focuses on the return activities after migrants have returned. Hu and Wu (2012) study the impact of the village leaders' migration experience on rural economic development in China. Using data from the 2005 China General Social Survey (CGSS), the impacts are measured by villages' per capita net income and the number of collective or private enterprises in the village. They conclude that village leaders' migration experiences have a positive impact on rural economic development.

In addition, return migrants are more likely to be engaged in self-employment activities. For example, Dustmann and Kirchkamp (2002) emphasise the importance of estimating the migration duration and after return activity choices simultaneously. Using data from the 1984, 1986 and 1988 interviews for Turkish return migrants who used to

migrate to Germany, they find that better educated immigrants have shorter migration durations but are more likely to be self-employed or wage-employed.

Mesnard (2004) argues that temporary migration could help migrants from poor countries to alleviate borrowing constraints. Using the 1986 survey data on return migrants and non-migrants in Tunisia, he investigates the relationship between being self-employed and savings accumulated abroad. Whether the individual migrated before 1974 and a quadratic in age at return are selected as instrumental variables to correct for the potential endogeneity of savings in the probit self-employment choice model. Mesnard (2004) finds that savings have a positive effect on choosing self-employment activity.

Piracha and Vadean (2010) employ the 2005 ALSMS to study the occupation choice between Albanian return migrants and non-migrants. Using a multinominal logit model, they find that past migration experience has a significant effect on self-employment choice. Meanwhile, Junge et al. (2015) use a multinominal logit model to examine the after return activity among non-migrants, local return migrants and regional return migrants in Thailand and Vietnam. The findings suggest that regional return migrants are more likely to undertake non-farm jobs after return in both countries, while only Vietnamese local return migrants are more likely to undertake non-farm jobs after return.

In terms of Chinese studies on the occupation choices, Zhao (2002) finds that return migrants not only purchase more durable goods and build more houses than migrants and non-migrants, but they also invest more into farm machinery. The latter finding may explain why return migrants are more likely to be engaged in farm work than non-migrants. By contrast, Chunyu et al. (2013) conclude that return migrants are more likely to be engaged in nonfarm jobs.

Demurger and Xu (2011) conduct a rural survey in the Wuwei County (in the Anhui province) in 2008, where there are active policies to attract return migration from other cities. In their survey, they compare the self-employment activities between non-migrants and return migrants. The probit model with endogenous return migration status shows that return migrants are more likely to be self-employed than

non-migrants[35]. When further concentrating on the return migrants' sample, Demurger and Xu (2011) find that accumulated savings and job changing experience during the migration are determinants for return migrants to be self-employed. In addition, the economic development in Wuwei influences the likelihood that return migrants are self-employed. However, Wang and Yang (2013) use the 2006 CGSS to examine the occupation choices between return migrants and non-migrants. They find that migration experience may not be a factor in affecting the probability of being self-employed or wage-employed after return.

Meanwhile, return migrants are more likely to experience occupational mobility. Cobo et al. (2010) compare the occupational mobility of return migrants from the US to four Latin America countries and non-migrants in these countries by using a multinominal logit model. They find that upward occupational mobility is more likely to happen if individuals migrate before the age at 25. However, return migrants in Costa Rica and Guatemala are more likely to experience upward occupational mobility while return migrants in Mexico and Puerto Rico are more likely to experience downward occupational mobility, which suggests that both economic and social differences exist in these Latin America countries.

Similarly, Carletto and Kilic (2011) compare the occupational mobility of Albanian emigrants to Italy and Greece as well as non-migrants. The ordered probit model is used to estimate whether an individual has experienced upward or downward occupational mobility. When taking account of the endogenous nature of the migration experience and return decision[36], they conclude that past migration experience has a positive impact on upward occupational mobility. However, this impact is more significant if migrate to Italy but not to Greece. This is because migrants to Greece are typically undertaking low-skilled jobs.

4.3.4 Summary

Three points can be derived from the literature summarised above. The first is

[35] The instrumental variable is the proportion of adult male migrants to total adult males in community.

[36] The instrumental variables for the endogenous variables are whether the individual speaks Greek or Italian in 1990 and number of children upon return.

related to the data used in the literature. The GSOEP and ALSMS are two datasets used to study return migration in Europe, where the former is a destination based survey while the latter is an origin based survey. Both surveys may provide biased migration information on either return migrants or migrants. To be specific, the GSOEP may ask immigrants in Germany to provide information on return migrants who are not in Germany. Similarly, the ALSMS may have asked one of the family members to provide information on emigrants who are in a migration country. The same problems can be seen among Chinese datasets used in the literature. In addition, some studies argue that the number of return migrants in the GSOEP may be over-identified as those migrants who disappeared from the panel survey are also identified as return migrants (Constant and Massey, 2002 & 2003; Kirdar, 2009). By contrast, in terms of the dataset used in this chapter, return migrants were interviewed in their place of origin while migrant workers were interviewed in migration destinations, which best avoids providing biased migration information for analysis.

Secondly, discrete choice models are commonly used in the literature, where return migration status is usually represented by a dummy variable. Migration duration variable should be endogenous when examining the relationship between migration duration and return status. However, the continuous-time survival analysis not only uses the censoring status of migration duration to identify return migrants, but it can also avoid using instruments to correct for the endogenous duration variable.

The third conclusion from the literature is the factors that motivate international and internal return migrations are similar. For example, family separation may induce return migration which can be seen in both the international and the internal return migration literature. Therefore, the migration theories which explain international return migration can also be applied to internal return migration.

4.4 Data and Methodology

4.4.1 Data

Data from the Chinese part of the Rural-Urban Migration in China (RUMiC) are

employed in this chapter. The RUMiC is a collaborative project among the Australian National University, Beijing Normal University and the Institute for the Study of Labor (IZA). The objective of this project is to investigate migration in China and the role of the changing labour market. The rural household survey (RHS) and migrant household survey (MHS) are two of the sub-surveys of this project.

In the 2009 RHS, respondents were asked *have you ever migrated out for work*. If the answer was *yes*, then the questionnaire further asked *when did you first migrate out to work (year)* and *when was the last time you stayed in your home village continuously for more than three months (year)*. If all three questions were answered, this respondent could be identified as a return migrant. In order to compare the return decision made by the return migrants, migrant workers are added to the sample, which are a group of people who are still in migration. They are identified from the 2009 MHS, where respondents were asked *when did you first migrate out for work (year)*.

Migrant workers can also be identified from the RHS if respondents in that survey did not report a return year. However, this chapter does not include migrant workers from the RHS survey. Respondents with a missing return year may not actually be migrant workers as they might have forgotten to report their return year. Meanwhile, migrant workers in the RHS were not interviewed in the migration city, which may record biased information about their migration experience. Therefore, this chapter takes advantage of the origin based RHS and destination based MHS to study return migration in China.

The migration duration can be obtained from both sub-surveys, which acts as the dependent variable of the return decision model. For the return migrants, their migration durations are the difference between the year of return to the home village and the first migration year, which are complete durations. However, as the migrant workers are still working in cities when surveyed, they do not need to report the return years. Their migration durations are the difference between the survey year (that is 2009) and the first migration year, which are incomplete or right-censored durations. In addition, taking advantage of the longitudinal nature of the survey, return migrants' before return information can be obtained from the 2008 RHS if they answered relevant questions.

The selection of the independent variables is based on the theory of new economics of labour migration (NELM). The first group of the controls are personal characteristics. A dummy variable for males is generated. Age at first migration is used in the analysis. Since migrants who start migration at an older age may spend less time in the destination location (Dustmann, 2003b). The older the first migration age, the shorter the migration duration tends to be. In terms of this chapter, as some migrants aged over 60 are still working in cities, they may also come to cities at an age over 60. Therefore, the maximum first migration age is not set, only those whose first migration age is more than 16 are kept in the sample. In addition, years of formal schooling is used to represent respondents' educational levels.

The second group of controls are employment variables. Past migration occupations are generated for the return migrants whilst current occupation is generated for migrant workers. The occupation categories are management personnel (reference group), service workers, construction workers, manufacturing workers and other occupations (including agricultural workers and self-employed), which are common occupations among migrants. In addition, the natural logarithm of the hourly wage is generated, where it is the past migration hourly wage for the return migrants. Therefore, real hourly wages for return migrants are used in the analysis, which is based on 2009 prices. The hourly wage variable is used to test hypothesis 1, that higher hourly wages reduce migration duration.

For the household variables, the number of children at the return year is generated for return migrants. By contrast, the number of children at the survey year is generated for migrant workers. Although past migration information should be used consistently for the return migrants' variables coding, this is not possible due to lack of data availability. Table 4-2 tabulates the return duration of the return migrants, which is the duration between return year and the survey year. It can be seen that 70.07% of return migration occurred less than one year to the time of the survey and 91.69% of return migration occurred within three years, both of which imply that most return migration occurred between 2006 and 2009. Therefore, it is sensible to assume that some household situations do not change significantly within these three years. For example,

as farm land cannot be transferred or contracted privately in China, the size of the household's holding (in mu)[37] should be constant before and after the return. The natural logarithm of annual household savings is generated to test hypothesis 2, which states that return migration occurs if migrants have realised their savings target at the destination. Although the amount of household savings is the value at the time of the survey for return migrants, it is sensible to believe that return migrants would not consume all their migration savings shortly after their return. Meanwhile, it is also sensible to assume that household savings would not increase significantly shortly after return unless return migration is due to being able to receive a higher income on return.

Table 4-2 Tabulation of the return duration

Return Duration	Freq.	Percent	Cum.
0	191	11.42	11.42
1	985	58.91	70.33
2	227	13.58	83.91
3	130	7.78	91.69
4	49	2.93	94.62
5	27	1.61	96.23
6	17	1.02	97.25
7	6	0.36	97.61
8	8	0.48	98.09
9	8	0.48	98.56
10	5	0.30	98.86
11	2	0.12	98.98
12	9	0.54	99.52
13	4	0.24	99.76
14	2	0.12	99.88
19	1	0.06	99.94
21	1	0.06	100.00
Total	1,672	100.00	

Note: return duration is the difference between the survey year and return year

The final group of controls are the network variables. The number of other migrant workers in the household is generated. In particular, this variable is coded as the number of other migrant workers at the return year for return migrants. Moreover, both the 2009

[37] 1 mu≈666.67 m^2

MHS and RHS asked respondents during the 2009 Chinese New Year, the number of greetings they sent to people living in cities, in order to give approximate numbers of friends they know in cities. For return migrants, although the number may have been different to that when they were migrant workers, it is sensible to assume that the number of people they know in cities does not change significantly after they return. The number of friends variable can be used to test hypothesis 3, which states that a larger social network is associated with a longer migration duration.

New generation migrants are defined as those who were born after 1980. To find whether there are return decision differences between the new and old generation migrants, interaction terms can be generated to explore the differences between the two groups. To be specific, a binary variable representing whether the individual is a new generation migrant is interacted with the natural logarithm of hourly wage, natural logarithm of annual household saving and number of friends respectively.

4.4.2 Methodology

Continuous-time survival analysis is applied to the pooled sample of migrant workers and return migrants in this chapter. Although binary choice models are able to distinguish between migrant workers and return migrants in the analysis and have been used in the previous literature, they do not account for the right-censoring characteristic of migration duration and the impact of length of duration on return decision. Therefore, continuous-time survival analysis is used in this chapter to examine and identify return motivations in China.

$$h(t \mid x_i) = h_0(t)\exp(\beta x_i) \tag{4-1}$$

The introduction to the survival analysis starts from the hazard function, which is the instantaneous rate of failure (Cleves et al., 2010). Equation 4-1 gives the expression for the hazard function, where coefficients β are to be estimated from the regression and t is the duration. x_i are covariates used in the regression. A crucial part of the survival analysis is to find a distribution for the baseline hazard ($h_0(t)$), which is the hazard that every respondent faces and can be either a specific shape or flexible in shape.

Figure 4-1 illustrates the smoothed hazard function, which is a nonparametric

analysis derived from the duration data. It can be seen that the hazard increases with migration duration but a local minimum is observed at around 30. However, the shape of the hazard does not monotonically increase, which implies that commonly used hazard distributions in the survival analysis may not match the hazard shape in this chapter. In addition, there is a lack of theoretical support for any particular shape between return migration probability and migration duration, which means that it is not possible to argue that a specific hazard distribution can best fit the survival data in this chapter. Therefore, the Cox proportional hazard model (Cox, 1972) is estimated, which leaves the baseline hazard part unspecified and allows the shape of the hazard to be flexible.

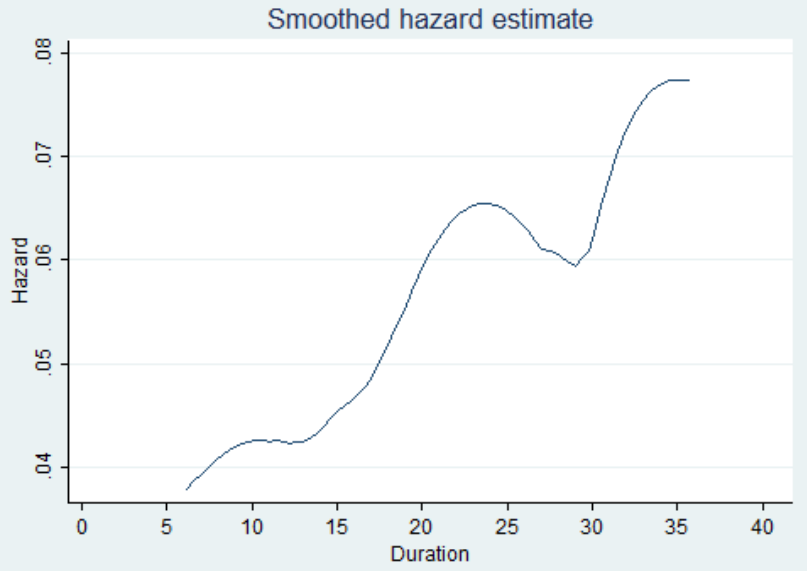

Figure 4-1 Smoothed hazard function

To justify whether the Cox model is able to provide consistent results, a semiparametric approach is used for comparison purposes. This involves splitting the migration duration into several intervals and assuming that the baseline hazard is constant in each interval. The definition of the intervals in this chapter is based on the average migration duration of the sample. The average migration duration of the overall sample is 7.27 years while it is 6.48 years for the return migrants, which suggests that the migration duration at around 7 years should be a peak time for completing migration. Therefore, the first interval is defined as [1, 7]. Afterwards, the intervals are defined using 10-year as the band until to the maximum analysis time. The other intervals are [8,

17], [18, 27], [28, 37], [38, 44]. The first interval, [1, 7], acts as the reference category in the regression while other intervals are included in the baseline hazard of the exponential model.

However, it has been argued that it is important to consider unobserved heterogeneity in survival analysis (Lancaster, 1979; Heckman and Singer, 1984) as some migrant workers return earlier than others due to unobserved factors. Therefore, a semiparametric approach is used in this chapter following Meyer (1990) and Appleton et al. (2002) to consider the unobserved heterogeneity. Equation 4-1 now becomes,

$$h(t \mid d_j, x_i) = \theta_i h_0(\alpha_2 d_2 + \alpha_3 d_3 + \alpha_4 d_4 + \alpha_5 d_5)\exp(\beta x_i) \qquad (4\text{-}2)$$

where d_i (i=2, 3, 4, 5) is one of the interval dummies. θ_i captures unobserved heterogeneity with a gamma distribution (mean 1 and variance σ^2). By contrast, as the Cox model only considers shared frailty, unobserved heterogeneity does not apply to the single spell duration data in this chapter.

As Table 4-1 divides the migrant population into local and non-local migrants, it is also interesting to control for being a local migrant in the analysis. According to the 2008 RHS, if a return migrant's past working location was in a rural area of the local county, towns of the local county or the local county seat, this return migrant can be identified as a local migrant. By contrast, from the 2009 MHS, if a migrant worker reported being registered in local areas, then this migrant worker can be identified as a local migrant. Being a local migrant means the migration distance is shorter than a non-local migrant.

4.5 Results and Discussion

In this section, descriptive statistics on the data are presented first; then, the results from the Cox model are interpreted and discussed.

4.5.1 Descriptive statistics

Table 4-3 presents detailed information on the number of observations and average durations. There are 4,830 observations in total in the full sample, of which 1,672 are return migrants while 3,158 are migrant workers. 2,294 of the total observations are the

new generation migrants, which accounts for 47.49% of the total observations. In addition, the average migration duration of the full sample is 7.27 years, with the minimum at 1 year and the maximum at 44 years. However, return migrants have complete migration durations with an average at 6.48 years. In particular, the new generation return migrants have an average duration at 3.48 years while it is 8.41 years for the old generation return migrants.

Table 4-3 Observations and migration durations

Duration (year)				Old Generation				New Generation				Total
	Ave.	Min	Max	Ave.	Min	Max	Obs.	Ave.	Min	Max	Obs.	Obs.
Full	7.27	1	44	10.28	1	44	2,536	3.95	1	13	2,294	4,830
Migrant workers	7.70	1	44	11.54	1	44	1,519	4.13	1	13	1,639	3,158
Return migrants	6.48	1	41	8.41	1	41	1,017	3.48	1	13	655	1,672

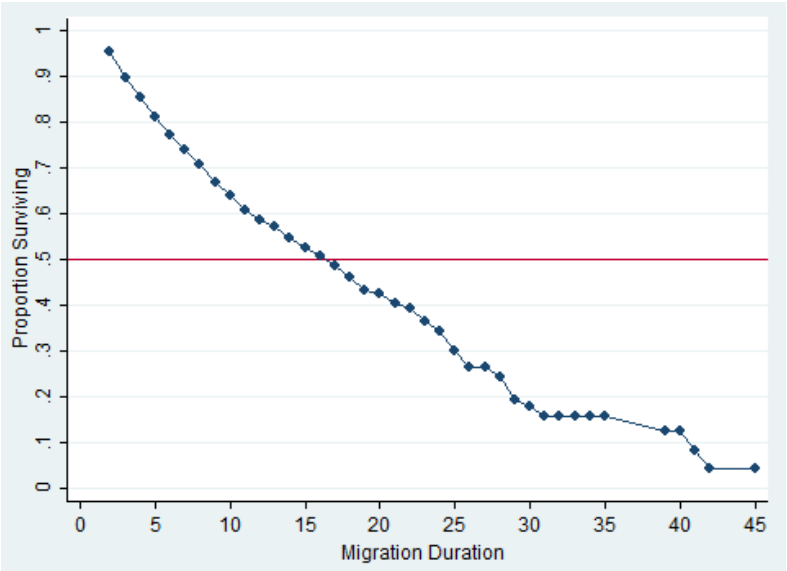

Figure 4-2 Survival function derived from the life table

Nonparametric analysis presents the survival data without assumptions about the functional form of the hazard. Figure 4-2 illustrates the survival function from the life table graphically, where each dot represents the probability of survival past time t (migration duration). The estimation of survival probabilities uses the Kaplan-Meier method, which is the product of the probability of survival at each time interval (equation 4-3). n_j is the number of observations at the beginning of time interval j and d_j is the number of observations which failed at the end of time interval j. It can be seen from Figure 4-2 that survival probability declines with duration, meaning that all

Table 4-4 Descriptive statistics

	Full			Old Generation			New Generation		
	Mean	**Min.**	**Max.**	**Mean**	**Min.**	**Max.**	**Mean**	**Min.**	**Max.**
Personal									
Male	0.6443	0	1	0.6802	0	1	0.6046	0	1
Age at survey year	31.53	17	66	38.83	30	66	23.47	17	29
Age at migration	23.69	16	61	27.79	16	61	19.17	16	28
Years of schooling	9.08	0	20	8.34	0	16	9.90	2	20
Employment									
Management personnel (ref.)	0.0967	0	1	0.0875	0	1	0.1068	0	1
Service worker	0.4389	0	1	0.3963	0	1	0.4861	0	1
Construction worker	0.1418	0	1	0.1991	0	1	0.0785	0	1
Manufacturing worker	0.2433	0	1	0.2098	0	1	0.2803	0	1
Agricultural & self-employed*	0.0793	0	1	0.1073	0	1	0.0484	0	1
Natural log of hourly wage	1.85	-5.08	5.29	1.86	-5.08	5.29	1.85	-3.19	4.72
Household									
Number of children	0.7242	0	4	1.16	0	4	0.2454	0	3
Size of farm land	4.36	0	75	4.11	0	45	4.63	0	75
Natural log of annual saving	4.99	0	12.90	5.42	0	12.90	4.52	0	11.61
Network									
Number of other migrants	0.4224	0	5	0.54	0	5	0.2934	0	4
Number of friends in cities	9.22	0	180	8.17	0	150	10.37	0	180
Location									
Local migrant	0.1896	0	1	0.2240	0	1	0.1517	0	1
Obs.		4,830			2,536			2,294	

* 6.83% of respondents in the overall sample are self-employed. 9.78% of the old generation migrants and 3.57% of the new generation migrants are self-employed.

migrants should return eventually. In addition, more than half of the observations have migration durations of less than 20 years.

$$\hat{S}(t) = \prod_{j|t_j \le t} \left(\frac{n_j - d_j}{n_j} \right) \tag{4-3}$$

Table 4-5 Years of schooling

Years of	Full		Old Generation		New Generation	
Schooling	Freq.	Percent	Freq.	Percent	Freq.	Percent
0	1	0.02	1	0.04	0	0
1	6	0.12	6	0.24	0	0
2	17	0.35	16	0.63	1	0.04
3	66	1.37	53	2.09	13	0.57
4	46	0.95	39	1.54	7	0.31
5	284	5.88	251	9.90	33	1.44
6	193	4.00	144	5.68	49	2.14
7	257	5.32	178	7.02	79	3.44
8	900	18.63	529	20.86	371	16.17
9	1,649	34.14	870	34.31	779	33.96
10	133	2.75	45	1.77	88	3.84
11	349	7.23	122	4.81	227	9.90
12	671	13.89	209	8.24	462	20.14
13	23	0.48	9	0.35	14	0.61
14	54	1.12	10	0.39	44	1.92
15	155	3.21	50	1.97	105	4.58
16	22	0.46	4	0.16	18	0.78
17	2	0.04	0	0	2	0.09
19	1	0.02	0	0	1	0.04
20	1	0.02	0	0	1	0.04
Total	4,830	100.00	2,536	100.00	2,294	100.00

Source: 2008 and 2009 RUMiC

Table 4-4 presents the descriptive statistics of all the covariates. These are separated by generations in order to compare the differences between them. Male respondents account for 64.43% of the total observations. The average number of years of schooling for the full sample is 9.08 years. China has a nine-year compulsory education system, which includes six-year elementary school education and three-year junior high school education. All children and teenagers at the appropriate schooling age are required to attend compulsory education, funded by the government. After completing compulsory education, teenagers may continue attending senior high school,

start technical school or work. Therefore, the average years of schooling in the full sample suggests that most of the respondents start work after completing compulsory education. When the years of schooling are tabulated (Table 4-5), it can be seen that 52.77% of the respondents in the full sample have 8 or 9 years of schooling. By contrast, 13.89% of them have 12 years of schooling, which is equal to having completed senior high school. Meanwhile, Table 4-4 shows that the old generation migrants have 8.34 average years of schooling while it is 9.9 years for the new generation migrants, which supports the view that the new generation migrants are better educated than their old counterparts and close to the aggregate levels at 8.8 and 9.8 years of schooling respectively (National Bureau of Statistics of China, 2011). In addition, Table 4-5 also shows that the percentage of the new generation migrants (20.14%) having 12 years of schooling is considerably higher than that for the old generation migrants (8.24%).

Table 4-6 Tabulation of age intervals

Age at Migration (%)	**Full**	**Old Generation**	**New Generation**
16-20	46.04	20.98	73.76
21-30	36.52	45.82	26.24
31-40	13.64	25.99	0
41-50	3.17	6.03	0
>51	0.62	1.18	0
Obs.	4,830	2,536	2,294

Source: 2009 RUMiC

In Table 4-4, the average first migration age of the full sample is 23.69. In addition, the average first migration age of the old generation migrants is 27.79 while it is 19.17 for the new generation migrants[38]. Table 4-6 provides frequencies for each age interval. It can be seen that 46.05% of the respondents in the full sample migrated at an age between 16 and 20. Meanwhile, 73.76% of the new generation migrants started migration between 16 and 20. By contrast, 45.82% of the old generation migrants started migration between 21 and 30. In order to give information on the age of the sample, Table 4-4 also reports the age at the survey year. However, this variable will not

[38] According to the report from the National Bureau of Statistics of China (2011), the average first migration age of the migrants was 26 in 2009. In particular, it is 33.7 for the old generation migrants and 20.6 for the new generation migrants.

be included in the analysis. To be specific, the average age at the survey year is 31.53 in the full sample. It is 38.83 and 23.47 for the old and new generation migrants respectively.

In terms of the employment situation in Table 4-4, 6.83% of respondents are self-employed, which is included in the agricultural and self-employed category. Service worker and manufacturing worker are common occupations among the respondents, which account for 43.89% and 24.33% of observations in the full sample respectively. However, the proportion of the new generation migrants undertaking construction work (7.85%) is much lower than that for the old generation migrants (19.91%), which is approximate to the aggregate statistics that only 9.8% of the new generation migrants are undertaking construction work in 2009 (National Bureau of Statistics of China, 2011). In addition, the old generation migrants have higher natural logarithm hourly wages (at 1.86) than their new generation counterparts (at 1.85).

For the household variables in Table 4-4, the average number of children in the full sample is 0.72, with the maximum number at 4. In particular, the average number of children among the old generation migrants is 1.16, which is much higher than the 0.25 for the new generation migrants. The average size of farm land in the full sample is 4.36 mu. Compared with the new generation migrants, the old generation migrants have higher natural logarithm annual household savings, at 4.52 and 5.42 for the new and old generation migrants respectively. In terms of the network variables in the full sample, the average number of other migrants in the household is 0.42. By contrast, the average number of friends in cities is 9.22. Finally, 19% of the respondents are local migrants.

4.5.2 Parametric analysis results

Table 4-7 shows the results when personal, employment, household and social network variables are controlled for simultaneously in the analysis. Hazard ratios are reported in the table, which are exponentials of the coefficients. The first column of this table presents the results from the Cox model. The hazard ratio of the natural logarithm of hourly wage shows that a 100% increase in hourly wages reduces the hazard of return by about 14.64%, which does not support hypothesis 1 that migrant workers are more likely to return when there is an increase in the hourly wage. The negative relationship

Table 4-7 Results of Cox and semiparametric models

	Cox (1)		Semiparametric (2)	
	Haz.Ratio	**Std.Err.**	**Haz.Ratio**	**Std.Err.**
Interval				
[8, 17]			1.3888***	0.1066
[18, 27]			1.9407***	0.3027
[28, 37]			3.9551***	1.5687
[38, 44]			10.6982***	7.4957
Personal				
Male	0.7929***	0.0456	0.7734***	0.0479
Age at migration	1.0629***	0.0186	1.0714***	0.0211
Age at migration squared	0.9997	0.0003	0.9996	0.0003
Years of schooling	1.1521**	0.0610	1.1714***	0.0667
Years of schooling squared	0.9902***	0.0031	0.9889***	0.0033
Employment				
Service worker	0.5039***	0.0494	0.4700***	0.0497
Construction worker	0.8987	0.0876	0.8713	0.0922
Manufacturing worker	1.5012***	0.1359	1.5975***	0.1581
Agricultural & self-employed	0.6928**	0.1033	0.6642**∗	0.1042
Natural log of hourly wage	0.8536***	0.0310	0.8265***	0.0359
Household				
Number of children	0.8790***	0.0297	0.8359***	0.0345
Size of farm land	1.0300***	0.0051	1.0347***	0.0058
Natural log of annual saving	1.0993***	0.0073	1.1101***	0.0082
Network				
Number of other migrants in household	0.2563***	0.0202	0.2338***	0.0193
Number of friends in cities	0.9891***	0.0027	0.9877***	0.0029
Constant			0.0113***	0.0044
Gamma variance			0.1456***	0.0586
Number of respondents			4,830	

***1% **5% *10%

between wage and return is also found in Dustmann (2003b) who studies the return intentions of immigrants in Germany. By contrast, migrants from the Republic of Moldova are unwilling to return if higher wages are paid in the migration destination countries (Pinger, 2010). Hourly wage is used to measure work effort in this chapter. Although Chinese migrant workers generally work longer hours, they are also lower paid, so unlikely to be able to cover living costs in cities (Yue et al., 2010). This fact suggests that even when there is an increase in the hourly wage, it may not reduce migrant workers' working hours significantly and can accelerate the return. Therefore, the hypothesis made based on the NELM may not apply to the Chinese context.

In terms of hypothesis 2, the hazard ratio of the natural logarithm of annual household saving shows that a 100% increase in the annual household savings would increase the hazard of return by 9.93%, which is consistent with this hypothesis. On the one hand, according to the NELM, migration is a life-cycle decision. Accumulating savings is one of the motivations for migration. Once the savings target is achieved, migrants return and consume their savings in their place of origin. Empirical evidence from both the UK and Germany supports this argument (Dustmann and Weiss, 2007; Kirdar, 2009). On the other hand, return migrants may use their migration savings to start a business after return, which potentially generates job opportunities if they employ other individuals (Piracha and Vadean, 2010). In this case, they view migration as a capital accumulating process. In China, migrant workers remit savings to rural hometowns for purposes such as building new houses or supporting left-behind family members (Zhu et al. 2012).

When the number of friends in cities increases by 1, the first column of Table 4-7 shows that the hazard of return reduces by 1.09%, which accepts the statement in hypothesis 3. This negative relationship between friends in cities and return migration shows that networks act as ties among migrant workers (Massey, 1990).

In terms of other hazard ratios in the first column of Table 4-7, males experience 20.71% less return migration than females. With an additional year of the first migration age, the hazard of return increases by 6.29%. However, this finding is inconsistent with Chunyu et al. (2013) who find that the first migration age is negatively related to the

probability of return in China. They argue that older migrants can make more informed decision about whether to return.

Figure 4-3 plots the quadratic term of years of schooling. It can be seen that the hazard of return decreases with the increase in year of schooling. However, there are mixed findings on the impact of education on return migration in the previous Chinese literature. On the one hand, Zhao (2002) finds that better educated migrants are more willing to return while Wang and Fan (2006) draw the opposite conclusion. On the other hand, evidence from the 1995 and 2000 Chinese census data suggests that better educated migrants have been more willing to return since the 1990s due to the rapid development in western parts of China and local policies to attract return migration (Chunyu et al., 2013). Therefore, the pattern in Figure 4-3 may imply that better educated migrants find it easier to stay in cities due to their human capital.

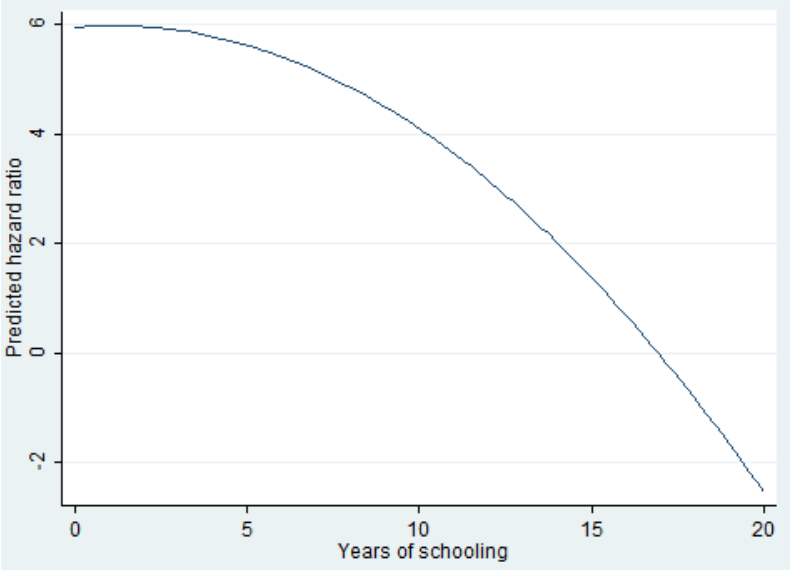

Figure 4-3 Quadratic term of year of schooling

For the employment covariates in the first column of Table 4-7, service workers and agricultural or self-employed workers experience 49.61% and 30.72% less return migration respectively compared with management personnel. By contrast, being a manufacturing worker has a 50.12% higher hazard of return than management personnel. The hazard ratio for the construction worker is insignificant at the 10% level. According to statistics from the National Bureau of Statistics of China, the industry structural adjustment after the 2008 financial crisis resulted in the proportion of migrant workers

undertaking manufacturing work to decline, from 37.2% in 2008 to 31.3% in 2014. Therefore, manufacturing workers became unemployed when there was a low demand globally and thus were less likely to settle down in cities permanently (Wang, 2000; Zhu and Chen, 2010; Liang et al., 2014). By contrast, the developing service industry has a high demand for migrant workers, which may bring stable jobs to migrant workers employed in that industry.

For control variables in the household group, an additional child reduces the hazard of return by 12.1%. This finding is counter to the view that return decision should take into account the well-being of children (Dustmann, 2003b; Piotrowski and Tong, 2013). Particularly in China, where there are 58 million rural left-behind children in 2009[39]. Parents' migration status significantly impact on school performance, confidence and health of the left-behind children (Murphy et al., 2015).

Farm land in the rural hometowns motivates migrant workers to return. To be specific, an additional mu of farm land increases the hazard of return by 3%. This result is similar to Hare (1999) who finds that an additional mu of farm land decreases the migration duration by about 27% in China. Farm land has an attachment effect on rural people. It is one of the assets of rural people in China. Rejecting rural household registration status also means losing the right to hold farm land. Therefore, in order to keep farm land, some migrant workers may reject the opportunity to get urban household registration status and eventually return to their hometowns (Zhu, 2007). Meanwhile, tax reductions or exemptions, as well as price increases in agricultural products since 2000, may increase the incentives for agricultural production and motivate migrant workers to return in order to undertake farm work (Liang et al., 2014).

In the network control group, when the number of other migrant workers in the household increases by 1, the hazard of return decreases by 74.37%. This result supports the view of the NELM that migration is a household decision. Other migrant workers from the same household are able to share the risk in the migration. Therefore, having friends or closer relatives in cities can delay return migration.

[39] Xinhua News, retrieved on August 11, 2015 from http://news.xinhuanet.com/society/2009-05/26/content_11438529.htm

The second column of Table 4-7 presents the results from the semiparametric model. The likelihood ratio test suggests statistically significant unobserved heterogeneity. It can be seen from Figure 4-4 that the baseline hazard is increasing. For example, the hazard of return for the second interval, [8, 17], is 38.88% higher than that of the reference interval [1, 7]. The hazard ratios of covariates in this column are approximate to those in the first column, which suggest that two models are able to present consistent results when the shape of the baseline hazard is either flexible or specified.

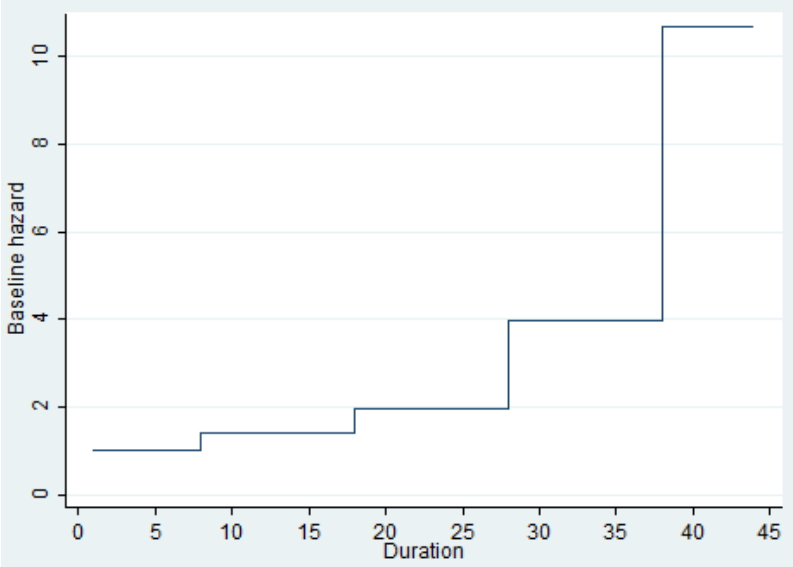

Figure 4-4 Baseline hazard of the semiparametric model

Table 4-8 presents the results when interaction terms are included in the analysis. The hazard ratios of the covariates show consistent directions with Table 4-7 expect the hazard ratio for children, which shows an additional child increase the hazard of return by 12.14%.

In terms of the interaction terms in the Cox model (first column), a 100% increase in hourly wage reduces the hazard of return by 29.12% when changing the migrant generation from the new to old. This finding suggests that the new generation migrants are more willing to return when there is an increase in the hourly wage, which is inconsistent with hypothesis 4. Meanwhile, a 100% increase in annual household savings increases the hazard of return by 2.48% when changing the migrant generation from the new to old. This finding is consistent with hypothesis 5 which suggests that the

Table 4-8 Results of Cox and semiparametric models include interaction terms

	Cox (1)		Semiparametric (2)	
	Haz.Ratio	**Std.Err.**	**Haz.Ratio**	**Std.Err.**
Interval				
[8, 17]			2.0950***	0.1311
[18, 27]			3.8853***	0.4916
[28, 37]			8.1224***	2.6669
[38, 44]			22.4775***	13.3188
Personal				
Male	0.8624**	0.0506	0.8632**	0.0506
Age at migration	1.3190***	0.0281	1.3252***	0.0282
Age at migration squared	0.9971***	0.0003	0.9971***	0.0003
Years of schooling	1.1255**	0.0603	1.1378**	0.0613
Years of schooling squared	0.9896***	0.0031	0.9885***	0.0031
New generation migrants	13.07***	2.4301	13.54***	2.5156
Employment				
Service worker	0.5134***	0.0503	0.4962***	0.0486
Construction worker	0.9808	0.0955	0.9763	0.0953
Manufacturing worker	1.4080***	0.1278	1.4126***	0.1284
Agricultural & self-employed	0.7314**	0.1088	0.7244**	0.1079
Natural log of hourly wage	1.0432	0.0543	1.0508	0.0550
Natural log of hourly wage*new generation	0.7088***	0.0519	0.6891***	0.0510
Household				
Number of children	1.1214***	0.0394	1.1258***	0.0395
Size of farm land	1.0190***	0.0053	1.0198***	0.0053
Natural log of annual saving	1.0966***	0.0097	1.1009***	0.0097
Natural log of annual saving*new generation	1.0248*	0.0137	1.0287**	0.0138
Network				
Number of other migrants in household	0.2671***	0.0208	0.2557***	0.0199
Number of friends in cities	0.9944*	0.0033	0.9943*	0.0033
Number of friends in cities*new generation	0.9887**	0.0055	0.9877**	0.0055
Constant			0.0001***	0.00003
Number of respondents		4, 830		

***1% **5% *10%

new generation migrants are less willing to return than their old generation counterpart when there is an annual household savings rise. Finally, an additional friend in cities reduces the hazard of return by 1.13% when changing generation from the new to old, which suggests that the new generation migrants are more willing to return than the old generation migrants even when they know more people in cities. Therefore, this finding is inconsistent with hypothesis 6. However, the likelihood ratio test suggests that unobserved heterogeneity is statistically insignificant in the semiparametric model. Therefore, results from the semiparametric approach without controlling for unobserved heterogeneity are reported in the second column of Table 4-8. Although consistent results can be found in this column compared to the first column, these should be interpreted cautiously as it seems not make sense to strongly argue that the two generations have no heterogeneity and no unobserved factors which motivate return migration.

The results on hourly wage and number of friends differ from the conventional view that the new generation migrants are less willing to return than the old generation migrants. Although there is an opportunity cost to returning, the new generation migrants may still find it is difficult for them to stay in cities permanently. A potential barrier is their rural household registration status. For example, it limits them from obtaining equal social welfare as the urban residents and adds difficulty to solve the housing problem if they want to stay in cities permanently. Even though the new generation migrants have a stronger desire to be integrated in city life, these invisible barriers between the rural and urban people make them disappointed and thus motivate their return.

Table 4-9 presents the Cox survival analysis results when the dummy of being a local migrant is included in the estimation. However, the hazard ratios of this dummy variable are insignificant at 5% level when both excluding (first column) and including (second column) interaction terms in the analysis, meaning that whether the individual is a local migrant or not has no impact on the return decision. It also reveals that migration distance has no impact on the return decision.

Finally, in terms of the discussion on whether return migration in China is due to

Table 4-9 Cox survival analysis results with local migrant control

	1		2	
	Haz.Ratio	**Std.Err.**	**Haz.Ratio**	**Std.Err.**
Personal				
Male	0.7950***	0.0458	0.8614**	0.0506
Age at migration	1.0642***	0.0186	1.3184***	0.0281
Age at migration squared	0.9997	0.0003	0.9972***	0.0003
Years of schooling	1.1524***	0.0610	1.1261**	0.0603
Years of schooling squared	0.9918***	0.0031	0.9896***	0.0031
New generation migrants			13.11***	2.4389
Employment				
Service worker	0.5019***	0.0493	0.5139***	0.0503
Construction worker	0.9000	0.0877	0.9794	0.0954
Manufacturing worker	1.4989***	0.1357	1.4080***	0.1278
Agricultural & self-employed	0.6896**	0.1029	0.7325**	0.1090
Natural log of hourly wage	0.8494***	0.0311	1.0463	0.0547
Natural log of hourly wage*new generation			0.7080***	0.0520
Household				
Number of children	0.8752***	0.0298	1.1244***	0.0398
Size of farm land	1.0298***	0.0051	1.0192***	0.0053
Natural log of annual saving	1.0994***	0.0073	1.0965***	0.0097
Natural log of annual saving*new generation			1.0250*	0.0137
Network				
Number of other migrants in household	0.2506***	0.0202	0.2674***	0.0208
Number of friends in cities	0.9893***	0.0027	0.9943*	0.0034
Number of friends in cities*new generation			0.9888**	0.0055
Location				
Local migrant	0.9383	0.0556	1.0361	0.0617
Obs.			4,830	

***1% **5% *10%

failure or success, the tabulation of return reasons among return migrants can provide evidence (Table 4-10). 1,454 return migrants reported their return reasons, which account for 86.96% of return migrants in the sample. The return reasons are failure, success and household reasons in this table. It can be seen that only 18.64% of return migration is due to failure. By contrast, 32.88% of return migration is due to success. Therefore, return migration in China is a combination of both failure and household reasons.

Table 4-10 Tabulation of return reasons

Return reasons	Percent
Failure	
Own illness	2.13
Did not like city or current job	5.71
Fired, cannot find another job	10.80
Success	
Help family business or farming	24.21
Wedding/marriage/building house	8.67
Household	
Family member's illness	3.99
Look after children	7.02
Others	
Other reasons	37.48
Obs.	1,454

Source: 2009 RHS, RUMiC

4.6 Conclusions

Return migration has become a new trend in China. This chapter argues that return migration is a combination of institutional barriers in cities, household reasons, and also because the movement of the economic activity to inland China requires migration. Therefore, this chapter identifies and examines the factors that motivate return migration in China, adopting an empirical model based on the NELM, which states that return migration is a life-cycle event and also a household decision. Using two sub-surveys from the 2009 RUMiC, return migrants and migrant workers are included in the sample. The censoring status of the migration duration is used to distinguish between return migrants and current migrants.

The results suggest that different occupations have different hazard of returns. To be specific, manufacturing workers experience more return migration compared with management personnel. By contrast, service workers as well as agricultural or self-employed workers experience less return migration compared to management personnel. In terms of household factors, farm land in rural hometowns attracts migrants to return.

Results for hypotheses 1 to 3 show that higher hourly wages in cities contribute to less return migration while return migration is more likely to occur if there are high annual household savings. The argument for these findings is that on the one hand, Chinese migrant workers are working long hours and being lower paid, so a wage rise may not reduce their working hours and shorten their migration duration. On the other hand, return migration will occur once they have achieved their savings target. Meanwhile, a wide social network in cities is able to prolong the migration duration.

The heterogeneities between the new and old generation migrants are tested by hypotheses 4 to 6. The new generation dummy is interacted with the variables of hourly wage, annual household saving and the number of friends respectively. However, the interaction terms suggest that the new generation migrants are more willing to return than the old generation migrants given a higher hourly wage and more friends in cities. This finding is contrary to the conventional view that the new generation migrants are more willing to stay in cities permanently. Therefore, findings from this chapter may imply that the rural registration status of migrant workers is still a barrier for them to stay in cities permanently even though the new generation migrants have such strong expectations. By contrast, when there is a higher annual household saving, the new generation migrants are less willing to return than their old generation counterparts. Finally, when the local migrant dummy is controlled for in the analysis, it can be seen that migration distance has no impact on return decision making.

One limitation of the data used in this chapter is that the origin or destination of the migration is unavailable. For the return migrants, their origins can be obtained from the dataset but not their migration destinations. By contrast, for the migrant workers, data on their migration destinations are available but not their place of origin. If both the

places of origin and destination were available from the dataset, it would indicate where migrants return from and to, enabling an illustration of routes of migration and return migration in China.

China proposed an urbanisation plan in 2012, which aims to either move the rural population to urban areas or entitle them to urban registration (Xinhua News, 2012). One of the reforms under the urbanisation plan is to allow migrant workers to permanently settle in cities, enabling them to get the same public services as their urban counterparts. Meanwhile, a specific guideline on return migrants' employment was announced in June 2015[40], which encourages migrant workers to return to hometowns and start businesses. Therefore, these policies may help to narrow the urban and rural divide and provide assistance to return migrants.

[40] Retrieved on October 9 2015 from http://www.gov.cn/xinwen/2015-06/21/content_2882326.htm.

Chapter Five

Conclusions

5.1 Summary of Findings

The thesis investigates the impact of labour market reforms in China. Chinese society is a dual society segregated between urban and rural areas by the household registration system. China's labour market and people have been potentially influenced by this dual system. Therefore, when investigating the labour market in China, this dual characteristic of the society should be taken into consideration.

Three conclusions can be drawn from this thesis. Firstly, since the 1978 policy of reform and opening up, the Chinese labour market became more mobile in terms of both job turnover and internal migration. In Chapter two, descriptive statistics from the 2008 China General Social Survey reveal that respondents changed jobs 0.82 times on average with a maximum at 7. The discrete-time survival analysis results show that urban and rural residents do not differ significantly in job turnover behaviours. In particular, job turnover is reduced when social insurances are provided, which suggests that employees concern about the welfare associated with their jobs. Findings from the analysis also suggest that job turnover is common in both the public and non-public sectors. This is because over time employment in the public sector may have lost the reputation of being secure and life-long in the post-reform Chinese labour market.

In addition, findings from chapter four confirm that the geographical mobility in China is not only from rural to urban areas, but also from urban to rural areas. Return migration implies that permanently staying in cities is difficult for Chinese migrants. Therefore, once migrant workers have met their income targets in urban areas, return migration would occur. In addition, the high willingness to return among the new generation migrants may imply that integrating into urban life is difficult for migrant workers even if they have a strong desire to stay in cities.

The second conclusion that can be drawn from this thesis is that employment benefits in China do not have a substitution effect for wages among both urban

employees and migrant workers. Unlike employment benefits such as in-kind payment which was used to compensate the deliberated low wages before the 1990s, benefits are still paid to employees in the Chinese urban labour market even if the wages are increasing after the 1990s. However, the benefits after the 1990s are more likely to be bonuses and social insurances rather than in-kind payment. In addition, it can be found that urban employees have higher wages, bonuses and the number of social insurances than migrant workers. By contrast, migrant workers have higher housing subsidies than urban employees. This finding implies that rurally registered migrant workers are unable to receive the same benefits as their urban counterparts in the urban labour market.

The final conclusion is that the household registration system is still having an impact on Chinese society and its labour market. People with different types of registration may have different concerns in terms of employment and welfare even if operating in the same labour market. In particular, rurally registered workers may not receive the same level of wage payment and welfare as their urban counterparts as well as facing more barriers of staying in cities.

5.2 Policy Implications

The policy implication of this thesis is that China not only needs a transition from a planned economy to a market one, but also needs to transit from a dual economy or society to an integrated one.

China has been undergoing a comprehensive reform since 2013, which aims to advance the modernisation in the State governance system and in governance capability (Xinhua News, 2013). The reform plan emphasises the decisive role of the market in resource allocation, implying that labour and wages should also be decided by the market as well. On the one hand, the development of the non-public sector provides more employment opportunities and diversifies the economy. Hence, the labour force may move to places where the skills can get higher returns and better matched. Although job turnover is not necessarily bad for the society, it is associated with costs

which both employees and employers may need to be responsible for. On the other hand, industries are moving to inland areas of China which will induce the movement of the migrant labour as well. The return migration in China can be regarded as a reallocation of labour when industry resources are reallocated. Meanwhile, the wage system is becoming market-oriented rather than administratively decided. Therefore, the market is playing a decisive role in production resources as well as labour reallocation in China. Findings from this thesis may provide evidence and insights to these changes.

In addition, the 2013 reform plan also aims to balance the development between rural and urban areas, allowing rural people to benefit and share the outcomes of economic development as well as urban people. Findings from this thesis reveal that even if operating in the same urban labour market, rurally registered people are facing different situations compared with their urban counterparts. From the institutional side, reforms on the household registration system are needed. The system should not divide the labour market and society. Moreover, coordinated rules and policies such as social insurances should be applied to people with different types of registration. Particularly when more rural registered people are moving into urban areas under an urbanisation plan since 2012 (Xinhua News, 2012), support should be given to help these people to integrate into urban life rather than making them feel as an outsider to cities.

5.3 Limitations and Future Research

The limitation of this thesis should be the dataset used for this research. In chapter two, as only a few migrant workers can be identified from the 2008 China General Social Survey, it is not possible to discuss employment of migrant workers and job turnover experienced by them. By contrast, migrant workers' employment histories were asked in the 2012 China Labour-force Dynamics Survey, which was released in July 2015. Therefore, the availability of new dataset enables future job turnover study to focus on migrant workers in China.

In addition, as chapter three does not justify the compensating wage differentials hypothesis, it might be interesting to examine the hypothesis by using panel data to

capture the changes of the relationship between wages and employment benefits as well as the changing characteristics of the respondents. However, Chinese panel data are uncommon and unable to provide all necessary information to examine this hypothesis[41].

In terms of chapter four, using interaction terms in the Cox model should be a feasible solution to find the heterogeneity between the new and old generation migrants. However, the proportional hazard assumption behind the Cox model may be weak, which implies that the two generations do not share the same shape of the hazard. Therefore, it might be necessary to consider other hazard specifications for the duration model and strongly argue that it can best fit the duration data. In addition, it is worth considering the time-varying characteristics of some covariates in the analysis if such information is available. In this case, a time-varying covariate can be split into several intervals and to see how the hazard of return migration changes among different intervals.

[41] China Nutrition and Health Survey is an ongoing panel survey started in 1989. However, this panel dataset is unable to offer all essential information to examine the compensating wage differentials hypothesis.

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